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PAPERS AND PROCEEDINGS  
OF THE  
*Sixty-fifth Annual Meeting*  
OF THE  
AMERICAN ECONOMIC ASSOCIATION

*Chicago, Illinois, December 27-29, 1952*

*Edited by James Washington Bell, Secretary of the Association*  
*and*  
*Gertrude Tait, Executive Assistant*



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PROGRAM OF THE SIXTY-FIFTH ANNUAL MEETING OF THE  
AMERICAN ECONOMIC ASSOCIATION

Chicago, Illinois, December 27-29, 1952

Four years ago, a plan of rotation was agreed upon by the Allied Social Science Associations in accordance with which "all-out" joint sessions were to be arranged every third year, so that in the intervening years each association might choose to meet at a time and place and with a program suited to the special interests of its own membership. The experiment has been partially successful, in that it has permitted a degree of freedom and autonomy that some felt was lacking under previous arrangements, but not wholly so, since in this year's all-out joint session opportunities for co-operative and co-sponsored meetings have not been as fully implemented as we had anticipated. Most sessions have been independently initiated and interassociation forces joined only after plans had been practically completed. This experience once more reflects the difficulties involved in co-ordinating the interests and resources of the several associations.

No effort has been made to organize this year's program around one central theme; nor can the sessions be conveniently grouped under a few related topics. Several sessions are devoted to economic theory, broadly construed, but more of them deal with various vital current problems, related principally to the impact of governmental activity on the economy in its international and domestic aspects. The opportunity afforded for co-operation with other groups is reflected in the sessions devoted to economic history, labor, agriculture, statistics, and sociology; and within our own group, two sessions have been organized by those who have a special interest in the field of transportation and public utilities. We have not considered it necessary to include the disclaimer, which authors often ask us to print as a footnote, to the effect that the opinions expressed are their own and not those of the agency or institution with which they are affiliated.

**Saturday, December 27, 1952**

10:00 A.M. *Meeting of the Executive Committee*

12:00 M. *Luncheon Meeting of the Executive Committee*

2:00 P.M. *Practical Uses of Transportation Flow Data* (Joint session with the American Statistical Association)<sup>1</sup>

*Chairman:* E. GROSVENOR PLOWMAN, United States Steel Corporation

*Papers:* R. TYNES SMITH, III, Interstate Commerce Commission; E. S. ROOT, Erie Railroad; D. M. STEINER, Department of Defense

*Discussion:* W. EDWARDS DEMING, Bureau of the Budget; C. AUSTIN SUTHERLAND, National Tank Truck Carriers; RAY S. KELLEY, JR., National Planning Association; DONALD C. HORTON, Bureau of the Budget

2:30 P.M. *Underdeveloped Countries: The Theory and Practice of Technical Assistance*

*Chairman:* CALVIN B. HOOVER, Duke University

*Papers:* G. E. BRITNELL, University of Saskatchewan; P. T. ELLSWORTH, University of Wisconsin

*Discussion:* EDWIN P. REUBENS, College of the City of New York; JOHN B. CONDLIFFE, University of California

**Sociology and Economic Science**

*Chairman:* FRANK W. NOTESTEIN, Princeton University

*Papers:* JOSEPH J. SPENGLER, Duke University; MANUEL GOTTLIEB, Harvard University; NELSON FOOTE, University of Chicago, and PAUL K. HATT, Northwestern University

*Discussion:* MARY JEAN BOWMAN, University of Kentucky

4:00 P.M. *Economic Forecasts and Their Accuracy* (Joint session with the American Statistical Association)<sup>1</sup>

*Chairman:* ARTHUR R. UPGREN, University of Minnesota

*Papers:* RUTLEDGE VINING, University of Virginia; ROBINSON NEWCOMBE, Office of Defense Mobilization, and PAUL McCracken, University of Michigan, and STAHL EDMUNDS, McGraw-Hill Publishing Company

<sup>1</sup> Publication outlet not known.

*Discussion:* GEOFFREY MOORE, National Bureau of Economic Research; LEWIS BASSIE, University of Illinois; T. V. KREPS, Stanford University; GERHARD COLM, National Planning Association

8:00 P.M. **Monetary Policy**

*Chairman:* JOHN H. WILLIAMS, Harvard University

*Papers:* HARRY JOHNSON, King's College, Cambridge; HENRY C. WALLICH, Yale University; MABEL F. TIMLIN, University of Saskatchewan

*Discussion:* LLOYD W. MINTS, University of Chicago; HERBERT STEIN, Committee for Economic Development; G. FINDLAY SHIRRAS, University of Illinois

**Development of Economic Thought**

*Chairman:* FRANK H. KNIGHT, University of Chicago

*Papers:* KARL PRIBRAM, Washington, D.C.; GREGOR SEBBA, University of Georgia

*Discussion:* JOSEPH J. SPENGLER, Duke University; CARL CHRIST, Johns Hopkins University; HARLAN L. McCracken, Louisiana State University

Sunday, December 28, 1952

9:30 A.M. **Governmental Economic Activity**

*Chairman:* ARTHUR F. BURNS, Columbia University

*Papers:* MOSES ABRAMOVITZ, Stanford University, and VERA ELIASBERG, National Bureau of Economic Research; LYLE C. FITCH, Drew University

*Discussion:* RONALD H. COASE, University of Buffalo; M. SLADE KENDRICK, Cornell University; THEODORE C. MESMER, United Nations

**Recent Developments in Mathematical Economics and Econometrics: An Expository Session** (Joint session with the Econometric Society)

*Chairman:* WASSILY W. LEONTIEF, Harvard University

*Papers:* ROBERT H. STROTZ, Northwestern University; LEONID HURWICZ, University of Minnesota; TJALLING C. KOOPMANS, Cowles Commission

*Discussion:* WILLIAM J. BAUMOL, Princeton University

**Long-run Effects of Full Employment on the Labor Market** (Joint session with the Industrial Relations Research Association)

*Chairman:* GLADYS L. PALMER, University of Pennsylvania

*Papers:* ALBERT E. REES, University of Chicago; CLARENCE D. LONG, Johns Hopkins University

*Discussion:* RICHARD A. LESTER, Princeton University; CHARLES A. MYERS, Massachusetts Institute of Technology

1:45 P.M. **The United States Demand for Imports** (Joint session with the Econometric Society)

*Chairman:* FRITZ MACHLUP, Johns Hopkins University

*Papers:* HANS P. NEISSER, New School for Social Research; ARNOLD C. HARBERGER, Johns Hopkins University

*Discussion:* JOHN H. ADLER, International Bank for Reconstruction and Development; HERBERT K. ZASSENHAUS, International Monetary Fund

2:30 P.M. **Technology**

*Chairman:* B. U. RATCHFORD, Duke University

*Papers:* CLARENCE E. AYRES, University of Texas; YALE BROZEN, Northwestern University

*Discussion:* M. C. URQUHART, Queen's University; IRVING H. SIEGEL, Twentieth Century Fund; W. N. LEONARD, Pennsylvania State College

**Research**

*Chairman:* SIMEON E. LELAND, Northwestern University

*Papers:* BERNARD F. HALEY, Stanford University; ROBERT D. CALKINS, Brookings Institution

*Discussion:* HOWARD S. ELLIS, University of California; ALFRED C. NEAL, Federal Reserve Bank of Boston; MILTON FRIEDMAN, University of Chicago; MEYER KESTENBAUM,<sup>2</sup> Hart, Schaffner & Marx; ARTHUR R. UPGREN, University of Minnesota

**Prospective Developments in Federal Regulation and Co-ordination of Transportation** (Program arranged by W. H. S. Stevens for group interested in transportation and public utilities)

<sup>2</sup> No manuscript received.



*Chairman:* KENT T. HEALY, Yale University

*Papers:* EDWIN C. JOHNSON, United States Senate; JACK GARRETT SCOTT, Under Secretary of Commerce for Transportation

*Discussion:* JOHN H. FREDERICK, University of Maryland; CHARLES S. MORGAN, Interstate Commerce Commission

***The Principles and Factors Influencing Managerial Decisions in Industrial Relations*** (Joint session with the Industrial Relations Research Association)<sup>3</sup>

*Chairman:* DOUGLASS V. BROWN, Massachusetts Institute of Technology

*Papers:* GEORGE KATONA, University of Michigan; JAMES C. WORTHY, Sears, Roebuck & Company

*Discussion:* E. H. VAN DELDEN, New York University; SIDNEY C. SUFRIN, Syracuse University

**4:00 P.M. *Labor Force and Employment Trends and Projections: 1900-2000*** (Joint session with the American Statistical Association)<sup>1</sup>

*Chairman:* CHARLES D. STEWART, Bureau of Labor Statistics

*Papers:* STANLEY LEBERGOTT, Bureau of the Budget; CALMAN WINEGARDEN, Bureau of Labor Statistics

*Discussion:* JOHN DURAND, United Nations; DAVID KAPLAN, Bureau of the Census; GLADYS L. PALMER, University of Pennsylvania

**5:00 P.M. *Annual Business Meeting and Awarding of the Francis A. Walker Medal***

**8:00 P.M. *In Memoriam: Harold Adams Innis, 1894-1952***<sup>4</sup>

*Chairman:* CHESTER W. WRIGHT, University of Chicago

*Papers:* VINCENT W. BLADEN, University of Toronto; W. T. EASTERBROOK, University of Toronto; JOSEPH H. WILLITS, Rockefeller Foundation

**Monday, December 29, 1952**

**9:30 A.M. *Interregional Analysis and Regional Development***

*Chairman:* EWALD T. GREYER, University of California

*Papers:* WALTER ISARD, Harvard University; JOHN DALES, McGill University

*Discussion:* DAVID SCHWARTZMAN, Montreal, Canada; PENELOPE HARTLAND THUNBERG, Council of Economic Advisers

***The Theory of Income Distribution***

*Chairman:* LLOYD G. REYNOLDS, Yale University

*Papers:* KENNETH E. BOULDING, University of Michigan; WILLIAM J. FELLNER, Yale University

*Discussion:* HAROLD M. LEVINSON, University of Michigan; EDWARD C. BUDD, Yale University; G. FINDLAY SHIRRAS, University of Illinois

**12:15 P.M. *Luncheon Meeting: Canada's Postwar Finance*** (Joint session with the American Finance Association and the Chicago Association of Commerce and Industry)<sup>5</sup>

*Chairman:* LEVERETT S. LYON, Chicago Association of Commerce and Industry

*Speaker:* W. C. CLARK, Deputy Minister of Finance, Canada

**2:30 P.M. *Economics in the Curricula of Agricultural Colleges in Canada and the United States*** (Joint session with the American Farm Economic Association)

*Chairman:* JOHN D. BLACK, Harvard University

*Papers:* ANDREW STEWART, University of Alberta; T. K. COWDEN, Michigan State College

*Discussion:* D. GALE JOHNSON, University of Chicago; FREDERICK V. WAUGH, U. S. Department of Agriculture

***Distribution and Utilization of Natural Gas*** (Program arranged by W. H. S. Stevens for group interested in transportation and public utilities)

*Chairman:* ELI W. CLEMENS, University of Maryland

*Papers:* DUDLEY F. PEGRUM, University of California at Los Angeles; H. J. O'LEARY, Wisconsin Public Service Commission

*Discussion:* HORACE M. GRAY, University of Illinois; JOSEPH R. ROSE, University of Pennsylvania

<sup>3</sup> To be published by the Industrial Relations Research Association.

<sup>4</sup> Published in the March, 1953, issue of the *American Economic Review*.

<sup>5</sup> This session had to be canceled due to the death of W. C. Clark. However, his paper appears in this volume (page 1).

4:00 P.M. *The Distribution of Government Burdens and Benefits* (Joint session with the American Statistical Association)

*Chairman:* SIMEON E. LELAND, Northwestern University

*Papers:* RICHARD A. MUSGRAVE, University of Michigan; RUFUS S. TUCKER, General Motors Corporation

*Discussion:* HAROLD M. GROVES, University of Wisconsin; EARL R. ROLPH, National Bureau of Economic Research; RICHARD B. GOODE, International Monetary Fund

6:00 P.M. *Dinner Meeting of the Executive Committee*

8:00 P.M. *A Stock-taking of Bretton Woods Objectives*

*Chairman:* HOWARD S. ELLIS, University of California

*Papers:* CLAIR WILCOX, Swarthmore College; WILLIAM ADAMS BROWN, JR., Brookings Institution; GOTTFRIED HABERLER, Harvard University

*Discussion:* MARCUS FLEMING,<sup>2</sup> Columbia University; HERBERT FURTH, Board of Governors of the Federal Reserve System; JOHN M. LETICHE, University of California; WILLARD L. THORP, Amherst College

*What Is Actuarial Soundness in a Pension Plan?* (Joint session with the American Statistical Association, the American Association of University Teachers of Insurance, and the Industrial Relations Research Association)<sup>6</sup>

*Chairman:* HENRY W. STEINHAUS, Equitable Life Assurance Society

*Papers:* DORRANCE C. BRONSON, Wyatt Company; RAY M. PETERSON, Equitable Life Assurance Society; GEORGE B. BUCK, Consulting Actuary; EDWIN S. COHEN, Hatch, Root, Barrett, Cohen & Knapp; SOLOMON BARKIN, Textile Workers, C.I.O.

<sup>6</sup>To be published elsewhere.

THE purpose of the American Economic Association, according to its charter, is the encouragement of economic research, the issue of publications on economic subjects, and the encouragement of perfect freedom of economic discussion. The Association as such takes no partisan attitude, nor does it commit its members to any position on practical economic questions. It is the organ of no party, sect, or institution. Persons of all shades of economic opinion are found among its members, and widely different issues are given a hearing in its annual meetings and through its publications. The Association, therefore, assumes no responsibility for the opinions expressed by those who participate in its meetings. Needless to say, the papers presented are the personal opinions of the authors and do not commit the organizations or institutions with which they are associated.

JAMES WASHINGTON BELL  
*Secretary*

## CANADA'S POSTWAR FINANCE<sup>1</sup>

By WILLIAM C. CLARK

*Deputy Minister of Finance, Canada*

There are several reasons why I regret very much that my Minister, the Honorable Douglas Abbott, was himself unable to accept this assignment, but the only one which I need take your time to mention today is that he would have been able to discuss Canada's recent financial story with much greater freedom from restraint than I enjoy. In keeping with the traditions—the sound traditions—of the Canadian Civil Service, I must resist the temptation to debate the merits of alternative public policies and confine myself primarily to the simple task of a reporter, sketching the general economic background and outlining the policies the government of Canada devised to meet the changing economic problem.

A forecaster at the close of the war would have had some warrant for taking a gloomy view of Canada's prospects during the succeeding half-dozen years. The war had cost our nation of just over 12 million people not far from 20 billion dollars, and while Canada's war finance policy had been as intelligent and as rigorous as that of any belligerent, nevertheless the net national debt had increased from 3.2 billion dollars prewar to 13.4 billions on March 31, 1946. Our industry had been vastly expanded for war purposes and we faced a task of suddenly integrating into a peacetime economy a very large volume of war plant capacity as well as nearly 1½ million war workers and men and women demobilized from the armed services. Finally, as a country in which export trade normally accounts for 20 to 25 per cent of total production, we were forced to look with concern on the vast destruction and dislocation which war had brought to a large part of the world and particularly on the impaired strength of our traditional major customers in Western Europe and the breakdown of the multi-lateral system of trade and payments.

However, as a result of a happy combination of good luck, good geography, and good people—the Canadian Government of course would add good management—postwar Canada has confounded the pessimists and has enjoyed a period of unexampled development. It has not all been plain sailing: we have had some squalls to weather,

<sup>1</sup>This paper was prepared for the joint luncheon session with the American Finance Association and the Chicago Association of Commerce and Industry but was not presented because of the untimely death of the author.—Editor.

some stormy seas to test our seamanship, but on the whole the log reveals a record of rapid, forward advance in all the major indices of Canadian growth. A panoramic view is to be found in the estimates of our gross national product. At the low point of the depression in 1933, that product had fallen to 3.6 billion dollars; in 1939 it had climbed to 5.7 billions and by 1945 to 11.9 billions. Today it is running at an annual rate in excess of 23 billion dollars. Since 1946, it has increased in real terms by over 24 per cent. This period of rapid expansion could be called a boom were it not that the growth has been so balanced and the traditional excesses and distortions of a boom so little in evidence.

If we seek the special causative forces behind this rapid expansion, we find that the first great lurch forward came from the war itself. Under the pressure of war demands, we expanded enormously our industrial plant, modernized our equipment, and built up a skilled labor force. We learned to manufacture the most complicated implements of war, not only for ourselves, but for our allies, and our businessmen found to their own surprise that when they had orders sufficient to warrant production on an optimum scale they could produce a great variety of articles as efficiently and cheaply as any other nation.

The great magnitude of and pride in our war effort were to bring new confidence not only to businessmen but to the whole Canadian people. The cautious attitude which had been fostered by experience with the economy's vulnerability in earlier periods began to give way to a more buoyant faith in the solid future of the country. This new faith grew with what it fed on, but without generating the excessive speculative fever that marked some earlier periods in our history.

The postwar period has also been a period of rather rapid population growth. Partly as a result of natural increase, partly as a result of a more vigorous immigration policy (which economic expansion has made practicable), and partly as a result of the voluntary accession of Newfoundland (which has also rounded out our physical boundaries), our population has increased by 17.4 per cent from mid-1946 to 14.4 million in mid-1952. In the same period your population grew by about 11 per cent. The 28 per cent expansion of the Canadian population since 1939, coupled of course with the large contemporaneous increase in your population, the market at our doors, has naturally had vital significance for Canadian trade and industry.

A more spectacular source of the dynamism in the Canadian economy has been the success which has attended the vigorous search for hidden riches in the natural resources field. The Laurentian Shield—the V-shaped area of rock which constitutes the geological backbone and more than half the area of Canada—is not only the world's oldest

rock but also probably its greatest treasure-trove of mineral wealth. Promising mineral areas are also to be found in the Cordilleran region of the Pacific Coast and the Appalachian region of the Maritime Provinces. In between the Rocky Mountains and the Pre-Cambrian rocks of the Laurentian Shield and stretching from the international boundary to the Arctic Ocean lie nearly a million square miles of interior plain underlain by sedimentary rocks of post-Cambrian origin with geological formations similar to those of the most prolific oil and gas producing regions of North America.

Most of Canada's earlier mineral discoveries were either the result of accident or the work of poorly equipped individual prospectors and thus in large part limited to cases where outcropping of rocks laid bare the earth's secrets. In the last few years, the aerial survey, the magnetometer, the seismograph, and other modern gadgets have revolutionized the art of exploration and in Canada have given rise to a regular rash of new discoveries. These include major new sources of nickel, copper, zinc, cobalt, uranium and asbestos, a new high-grade deposit of titanium ores, and vast new reserves of iron ore both in Northern Ontario and in Northern Quebec and Labrador. The latter project has now proved up reserves of over 400 million tons of high-grade ore and is expected to give rise to an annual shipment of 10 million tons by 1956 and of 20 million tons with the completion of the St. Lawrence Seaway. We have been particularly fortunate in discovering—and finding enterprisers and investors willing to take the risks involved in developing—new sources of such basic and strategic metals at a time when the world's need for them is great and when the United States has passed from the stage of net exporter to that of net importer of a number of them.

But most important of all for the stimulation and strengthening of Canada's economy have been the discoveries of oil in Alberta and the other Prairie Provinces and the indications they have given that Western Canada is, potentially, one of the world's major oil and gas producing areas. Some 225 million acres of oil and gas rights are now under lease or reservation and are being actively explored. Proven reserves of oil have increased from 65 million barrels to not far from 2 billion barrels—not counting the much larger reserves in the bituminous tar sands at Fort McMurray, the extraction of oil from which presents difficult but, we hope, not insoluble problems. Already oil production, which has been prorated to less than 60 per cent of the industry's potential, is nearly 40 per cent of Canada's requirements, compared with less than one-tenth of our much smaller needs a few years ago. While our oil consumption has been increasing twice as rapidly as yours, we expect to reach the stage of self-sufficiency by



1956, although a sensible international division of labor might suggest that we should always be exporters in one part of our country and importers in another. Discoveries of natural gas have been equally spectacular. Conservative estimates of our reserves show an increase to at least  $10\frac{1}{2}$  trillion cubic feet today from 7 trillion in June, 1950, and perhaps 2 trillion six years ago.

The last of the factors fostering the dynamism of the economy to which I shall refer is the vast sums that have been spent on resource development and other types of capital investment. New capital investment, exclusive of inventories, has absorbed a steadily increasing percentage of gross national product, rising from 14.2 per cent in 1946 to 21.6 per cent in 1951 and probably to something around 23 per cent in 1952. Since 1946 it has aggregated not far from 25 billion dollars and it has been estimated that in 1950 it was directly responsible for the employment of 800,000 people or about 15 per cent of our labor force. Since 1948 it has even exceeded exports as a main-spring of Canadian economic activity.

This investment boom has rested not only on the needs arising from increased population and the discovery of new outlets for investment but to a very considerable extent on the voluntary deferment of capital projects in the thirties and the enforced postponement of expansion during the war. With needs great because of long deferment, with accumulated business and personal savings at a high level, and with the prevailing spirit of optimism, the investment boom got under way very quickly and rapidly offset in large part the decline in government spending. The increase from year to year has been great and this heavy investment demand has combined with rapidly rising consumer expenditures and a very high level of exports to produce an upward pressure on the price level throughout most of the period.

The significance of this new capital investment goes much further than the direct employment which it has provided and the direct employment opportunities which arise out of it. Its real importance would seem to lie in the underlying change which is being wrought in the structure of the economy—changes in structure which both increase its productive capacity and competitive power and at the same time reduce its vulnerability.

Unlike previous periods of expansion in our history, the development this time has spread over all industries and been felt in all parts of the country. Much of it has served to increase our capacity to produce and distribute the basic materials and the various forms of fuel and energy on which industrial development and economic growth are based. Very large sums have been spent on the mechanization of agriculture, which is now capable of considerably higher production with

considerably less manpower. In forestry there has been a steady modernization and expansion of pulp and paper plant and a very large increase in the output of lumber. The oil and gas discoveries have stimulated intense activity in a whole range of projects, including, in addition to exploration and development work, the building of pipe lines, the construction of storage facilities, increase in refinery capacity, and the development of a petrochemical industry. Over a billion dollars have been spent in these fields since 1946 and over a quarter of a billion this year. Vast capital expenditures are also being made to mine, process, and bring to market the newly discovered minerals, particularly the iron ores, and also to expand the production of aluminum in Northern British Columbia. New investment in the utilities, electric power, transportation, communications, etc., accounts for more than 20 per cent of total investment resulting, to quote only one instance, in an increase of about 50 per cent in power production. Manufacturing has absorbed about 20 per cent of total investment and the fact that income originating in manufacturing has now rise to over 30 per cent of national income is one of several indications of the greater diversification and better balance of the economy.

It is interesting to note in passing that since the end of the war, if we take into account what we have lent or invested abroad, we have provided enough capital out of our own savings to finance the whole of our development program. It is true that in 1950 and 1951 Canadian savings equaled only about 90 per cent of the total, but for the period 1946 to 1951 we had a net investment abroad of 78 million dollars and that net result is not likely to have been affected very much either way by developments during 1952.

Finally, it should be added that the near-term outlook suggests no weakening of the driving power behind this capital development program. If there are certain fields in which slackness may develop, there are also likely to be powerful offsetting factors including the deferred demand for highways, housing, and many civic utilities, the probable intensification of the various developments resulting from the continuing success of the search for oil and gas, and not least the construction of the St. Lawrence Seaway and Power Project which Canadians hope to be able to start in the coming year.

It was in the light of this developing background that the government of Canada had to formulate its fiscal, financial, and commercial policies during the postwar period. As envisaged at the end of the war, the task of public policy was in general to assist in (1) smoothing the transition from war to peace, (2) restoring and maintaining a free enterprise economy of a dynamic and flexible character, (3) promoting a high and rising level of employment and income, and (4) "contain-



ing" the inflationary potential latent in huge war-deferred demand and high consumer liquidity. Later, the task of controlling inflation became even more important as heavy defense requirements were superimposed on an economy already stretched by the requirements of the heavy capital investment program. In keeping with our North American tradition of freedom, these general aims were to be sought, not by control and regimentation, but rather by fostering the right climate, by offering appropriate incentives, by guiding, steering, or coaxing the economy in the desired direction.

To ease the postwar transition as well as to provide improved machinery and greater driving power for a dynamic economy, a series of legislative measures were enacted as the war drew to its close. Authority was taken to set up an Industrial Development Bank to make sure that no sound industrial enterprise should lack the ability to raise sufficient funds to get started or to finance rapid growth merely because it was small or new or unknown to investors. A Farm Improvement Loans Act was passed to provide, through the device of a limited pool guarantee of intermediate term loans made by the commercial banks, ample funds to enable farmers to re-equip their farms and to construct or modernize farm homes and buildings. A Central Mortgage and Housing Corporation was established with ample funds to administer a comprehensive housing program, chiefly by participating in joint loans made by private lending institutions. An Export Credits Insurance Corporation was set up to promote export trade by insuring exporters, on a self-supporting basis, against some of the special risks involved in foreign trading. Further, in order to assist some of our traditional customers to purchase Canadian products and more rapidly re-establish their war-shattered economies, Parliament gave the Minister of Finance authority to grant export credits in very large volume, including a  $1\frac{1}{4}$  billion dollar loan to the United Kingdom on the same terms and conditions as the  $3\frac{3}{4}$  billion loan made by the United States about the same time.

Whatever these measures may have contributed, it is a fact that Canadian industry converted from war to peace with an amazing rapidity and smoothness. It must be remembered, of course, that there was a strong demand abroad for the things we produced and that several of the dynamic forces I have listed were already beginning to influence the Canadian economy.

In the annual budget speeches are to be found the Canadian Finance Minister's diagnosis of the prevailing and prospective economic situation and his prescription of the type of fiscal and financial policy which he believed to be required. The speeches for the first three postwar years show clearly his recognition that public finance is more than the

mere arithmetic of balancing the year's accounts and that the national budget is an integral part of the nation's business, influenced by and having its influence on the state of employment, income, and prices. They show him attempting to achieve in his fiscal policy a judicious balancing of several competing considerations. First was the recognition that the very high wartime tax rates tended to weaken initiative, blunt economic incentives, and thus impair productivity at a time when maximum efficient effort was essential to economic health and progress. Against this argument for lowering taxes, the Minister had to balance two opposing considerations: one, the general belief that it was a good thing to pay off debt in years of high prosperity, particularly when the debt had recently been built up to such huge proportions; and, two, the argument that it was desirable to help offset by a budgetary surplus the powerful inflationary pressure being exerted by the large backlog of deferred demand and the enormous volume of liquid resources which the war's financing had placed at the disposal of consumers.

The relative weight assigned to each of these factors varied to some extent from time to time with the changing economic climate. In the first three postwar years taxes were cut drastically but not to such a point as to prevent a substantial surplus, which was a declared aim of the second and third postwar budgets. The excess profits tax was first reduced and then repealed at the end of 1947. The standard rate of corporate income tax was reduced from 40 to 30 per cent in 1946. Personal income tax rates were cut successively in 1946, 1947, and 1949, with the total reduction amounting to between 60 and 70 per cent for the great majority of taxpayers.

By the beginning of 1949 the Minister was confident that the postwar inflation had subsided at least for the time being, and there were indications in business trends in your country that it was time to shift from the anti-inflationary bias of fiscal policy. In his new budget, therefore, he attempted to complete the process of tax reduction to levels that might be expected to persist in peacetime and aimed at little better than a balance in the accounts—a surplus of only 85 million dollars. There were further cuts in income tax but the main feature was the drastic recasting of commodity taxes. A great variety of commodity taxes were repealed and replaced by what was intended to be a normal peacetime structure, consisting of three parts: first, rather heavy sumptuary taxes on liquor and tobacco; second, the general sales tax levied at 8 per cent at the manufacturer's level on a wide list of goods but excluding all production goods, all building materials, and practically all foods; and, third, an additional special excise tax of 10 per cent on a relatively small but highly productive list of articles

of mass consumption ranging from cosmetics and furs to radios and motor cars.

Two special features of fiscal policy during this period deserve brief mention. First was the initiation of a program designed to lessen and ultimately to eliminate the double taxation of business profits. The first step to this end was taken by the budget of 1949, when authority was obtained to allow shareholders a credit against their personal income tax equal to 10 per cent of income received in the form of dividends. The other special feature relates to the so-called "tax rental" agreements with the provinces. In working out these agreements, the government had in mind three aims: to avoid some of the difficulties which the financially weaker provinces experienced during the depression of the thirties, to eliminate as far as practicable the evils of multiple and conflicting taxation, and to make it easier for the federal government to follow fiscal and economic policies designed to minimize cyclical fluctuations. Under these agreements, provincial governments may rent to the federal government for a five-year period their rights to levy income taxes, corporation taxes, and succession duties in return for annual rentals which are guaranteed never to fall below certain stipulated amounts and which are increased in proportion to any increase in provincial population and in gross national production per capita. Eight of the ten Canadian provinces participated in such agreements during the last five years and nine of them have recently signed agreements for the next five years. As a result there is only one personal income tax in Canada (the federal) and two corporation taxes (the federal and that of Quebec), while succession duties are levied only by the federal government and the provinces of Ontario and Quebec.

In each of the fiscal years 1947, 1948, and 1949, despite the substantial magnitude of the tax reductions that had been made, actual revenues exceeded actual expenditures by a substantial amount. In fact, the surpluses amounted to 14, 31, and 27 per cent, respectively, of total revenues and in the aggregate to 1,645 million dollars or 12.3 per cent of the net debt at its war-end peak. In the last two of these years, when expenditures ran a little under 2,200 million dollars a year, the Minister had budgeted for substantial surpluses, but even his optimistic forecasts were exceeded. Even in the fiscal year 1950 the trend of activity in Canada, contrary to some expectations, remained persistently upward, and the year ended with a further addition of 131 million dollars to the postwar reduction of net debt.

The contra-inflationary aim of fiscal policy during this period was supplemented by intensive annual savings bond campaigns designed to encourage individuals to continue the habits of systematic saving

developed during the war. Moreover, the various wartime controls, particularly the controls over commodity prices and rents, were relaxed only gradually in Canada. Nevertheless, there was a rapid increase in prices after the war, reflecting partly the translation of wartime subsidies into prices, partly the general inflationary trend to higher prices throughout the world, and partly the internal pressure upon resources. The slower pace of decontrol in Canada delayed the full impact of the war and its aftermath on Canadian prices, but toward the end of 1948 a new plateau had been reached with wholesale prices a little more than double and the cost-of-living index about 60 per cent in excess of the respective prewar levels. The next year and a half was to be a period of approximate stability in prices, with the fires of inflation banked, though probably not extinguished.

Then this short spell of fairly normal conditions which had seemed like the beginning of a promising period of sustained peacetime expansion was rudely interrupted by the Korean war. Suddenly we had to superimpose a defense program involving expenditures rising to four or five times their previous size on an economy which was already straining its resources to meet the demands of an unprecedented capital investment program and of a public anxious to increase both its volume of consumption and its leisure. At the same time, in Canada, as in other countries, we were too near the end of World War II to have forgotten the nature of a full-fledged war economy and immediately there began a wave of abnormally heavy buying, by consumers as well as by trade and industry, in order to forestall the expected shortages and higher prices of a war period. Again, because we export more than a fifth of everything we produce and import more than a fifth of everything we consume, a major source of the renewed pressure on our price structure was the inflationary rise in prices throughout the world.

In the new war against communism and this renewed war against inflation, the major task of public policy was to assess priorities, limit competing demands, and assure that adequate resources were available for the tasks with the highest priority ratings. In its approach to this task, the government had to make a choice between a system of comprehensive, direct controls and the application of general policies designed to bring about the desired results indirectly.

There was great temptation and pressure to use the direct method and apply immediately over-all price controls. The control of inflation during the war had been highly successful and the public tended to attribute this success solely to the spectacular imposition and maintenance of a general price ceiling and failed to understand how much it depended on the powerful indirect controls that were also at work—

the very heavy taxation, the stiff controls over credit, and the vigor with which the campaigns to maximize and mobilize public savings were conducted—as well as on a massive application of direct controls on many other aspects of economic life and on general patriotic support which can be sustained only in a full-out war effort. Close analysis of the new situation, however, revealed an entirely new set of conditions. We appeared to be faced not with a short, all-out war but with a hot phase of a cold war of indeterminate duration, perhaps five to ten years, perhaps longer—a war effort that might take 10 to 20 per cent of our national product rather than 40 to 50 per cent, a continuing struggle in which the strength and vitality of our free institutions might be as important as our armed might. Believing, therefore, (1) that over-all price controls could not obtain the almost universal support they would need to make them administratively feasible, (2) that if, as seemed probable, they might have to be maintained for a long time, they would tend to impair the productive efficiency of the economy and to undermine the foundations of the very freedom we were seeking to defend, and (3) that in any case they would do nothing to attack the root causes of the threatened inflation, the government decided to rely upon the indirect methods of fiscal, monetary, and credit policies, supplemented where necessary and where capable of easy administration by a few direct controls at particular points of pressure.

Post-Korea budgets reflected this reversal in the immediately preceding trend of fiscal policy. Faced by the prospect of soon reaching more than double the recent level of total expenditures, despite the savings and deferments he was able to effect in the nondefense field, the Finance Minister sought to produce what he called a fully or amply balanced budget by tax increases and to secure certain supplementary anti-inflationary benefits by the particular distribution of these tax increases. Taxes on personal and corporate incomes were increased by 20 per cent, but an excess profits tax was avoided because of what was believed likely to be, under the prospective conditions, its hampering effect on efficiency and productivity as well as its inequities and its administrative difficulties. Nearly half of the increased revenue yield was designed to come from increased sales and excise taxes, because the Minister believed that while such commodity taxes would, in the first instance, raise prices, it was fundamentally more anti-inflationary to restrain consumption and encourage saving by such taxes on spending than still further to increase taxes on incomes which are, in effect, taxes on producing.

While the Minister aimed in his post-Korea budgets at little better than a balance, his actual revenues reflected a more rapidly rising



trend of incomes and spending than he had expected and there has also been the perhaps inevitable lag in getting a large defense program operating at full speed. As a result there was a budgetary surplus of 211 million dollars in 1950-51 and one of 248 millions in 1951-52. These surpluses brought to 2,236 million dollars or 16.7 per cent the decrease in the net debt of Canada since the end of the war. For the current fiscal year, the budget forecast was for a slight surplus and it would now appear that this forecast will prove to be approximately accurate.

An interesting special feature of the budget of April 10, 1951, was the announcement of a novel experiment in fiscal policy to restrain less essential forms of capital investment. This involved the withdrawal for a four-year period of the right to depreciate assets acquired after the date of the budget, except for stipulated classes of undertakings deemed essential for defense purposes or for basic national development. It thus provided a stiff financial deterrent intended to conserve steel and other strategic materials in short supply and to discourage the type of investment which might be attractive, not because of its long-run soundness, but because it could be written off out of expected high profits in a few years of high corporate income tax. The device had sufficient teeth in it to compel the review of many expansion programs and to cause a shift in the pattern and distribution of planned investment toward the more fundamental and essential types of investment. It is being dropped at the end of this year.

It is scarcely necessary for me to add that the type of fiscal policy I have described has been the target of criticism, particularly in the last two or three years, by critics who contend, *inter alia*, that Canadian tax policy has been unduly and unnecessarily severe, that current high tax rates tend to blunt incentives and impair efficiency, and that reliance for contra-inflationary influence should have been placed on voluntary public saving rather than on savings resulting from a budgetary surplus. However, as I warned you at the beginning, it would be inappropriate for me to debate the respective merits of alternative public policies and I must stick to my role of reporting the policies that were actually followed.

Anti-inflationary fiscal policy in this recent period has been supplemented by monetary and credit policies with a similar bias. In October, 1950, the Bank of Canada raised its discount rate from 1½ to 2 per cent. As the commercial banks had not been borrowing from the central bank, the effect of this action was essentially psychological: it served as an indication of the central bank's appraisal of the market and a warning that its open market operations would likely be used in the direction of restraint rather than of expansion. The Bank con-

tinued to follow a policy of keeping the commercial banks in a fairly tight cash position. It was not long before the pressure of underlying forces brought a general upward adjustment of interest rates. Before Korea, the yield on long-term bonds was 2.7 per cent. By March, 1951, it had risen to 3.2 per cent and today it is about 3.7 per cent. In November, 1950, the government moved to restrain the expansion of credit by the introduction of consumer credit regulations, which were sharply stiffened four months later. In February, 1951, after a substantial growth in the outstanding volume of bank credit had occurred, a conference of the ten chartered banks called by the Bank of Canada resulted in a voluntary agreement under which the banks agreed to revise their lending policies in such a way as to avoid any further increase in the aggregate volume of bank loans and investments and to restrict certain categories of loans, including loans on securities and for installment financing.

In addition to these policies designed to attack the root causes of inflation, modest use has been made of certain direct controls, including the controls or priorities relating to the use of a few strategic materials in short supply, such as steel, base metals, and certain chemicals. Finally, the decision made by the government in September, 1950, to unpeg the Canadian dollar, which I shall have occasion to discuss later, was another contribution made at this time to the fight against inflation. The subsequent rise in the Canadian dollar has had the effect of reducing the cost of imports and the internal price of many of our exports by up to as much as 11 or 12 per cent below what they would otherwise have been.

Logic would suggest that Canada's indirect policies might take longer to produce their effects than the application of direct controls. In any case, the Canadian indices of wholesale prices and the cost of living kept rising after June, 1950, for a somewhat longer period and, particularly in the latter case, to a higher level than their U.S. counterparts. On the other hand, they have since fallen farther from the post-Korea peak. During the current year, for instance, our cost-of-living index has fallen by about  $3\frac{1}{2}$  per cent, while your consumer price index has risen by about 1 per cent. Last spring, some months after the hectic period of consumer spending and inventory accumulation had ended and when the inflationary threat seemed again under control, the government lifted its consumer credit restrictions and the Bank of Canada announced the suspension of all the voluntary restraints on bank credit except the higher margins on loans secured by stock market collateral. In the last few months, consumer spending, consumer credit, and bank credit have expanded substantially, but their effect has apparently been fully offset by such factors as the

abundant harvest, the rising trend of industrial production, the accumulated inventories, and an interim budgetary surplus.

Turning now to commercial policy, Canada is, as you know, a classic example of an "open economy," heavily dependent on foreign trade. While our gross national product, as I have said, is now running at an annual rate of about 23 billion dollars, our total foreign trade will exceed 8 billions in 1952. Traditionally, also, Canada has relied on earning a surplus from its overseas trade to pay for a deficit in our trade with the United States. It all adds up to this: the structure of the Canadian economy and its balance of payments are such that Canada is vitally dependent on a trading world organized so as to encourage a high level of multilateral trade and exchange convertibility. The creation of such an environment has been the main driving force behind Canada's trade and exchange policies in the postwar period.

As soon as the war was over, Canada proceeded with an important series of concrete steps to free the channels of commerce, both in the development of domestic policy and in helping to create an international environment which would encourage other countries to liberalize their trade. At home, the buoyant demand for Canadian exports and the satisfactory state of the exchange reserves made it possible to remove almost all the wartime trade restrictions, restore our dollar to parity with the U.S. dollar, and relax greatly the exchange controls on current payments. In collaboration with other countries, Canada took an important part in setting up the Bretton Woods institutions and the General Agreement on Tariffs and Trade in order to introduce stability in exchange and commercial relations between countries and to facilitate the development of the economically backward regions. To assist our overseas trading partners, we used the authority which Parliament had granted to extend almost 1.8 billion dollars of financial assistance in the form of export credits.

However, the path to convertibility and unrestricted trade in Canada was not without its pitfalls. By mid-1947, we found ourselves in balance-of-payment difficulties on dollar account, with our exchange reserves falling in less than two years from 1,500 million dollars to the dangerously low figure of under 500 millions. Our position was unique in a sense, because we had a significant surplus in our over-all current account during 1946 and 1947. The problem was simply this. By extending large credits abroad, we were selling part of our exports on credit at a time when buoyant levels of domestic investment and consumption greatly stimulated imports. The export of capital greatly exceeded the current account surplus, with the difference coming out of our exchange reserves. This experience brought home to Canada



in an emphatic way the simple lesson that still needs to be learned in some quarters: that there is a close relationship between the balance of payments and the pressure on available resources.

To deal with this problem the government adopted a comprehensive program to correct the imbalance and to restore the reserves to a more adequate level. The program was based partly on short-term emergency measures, including import restrictions, exchange controls, and substantially higher commodity taxes. At the same time, more fundamental steps were taken to slow down the rate of foreign lending, to expand output, and to increase dollar exports. The purpose of the direct controls was to arrest the drain on reserves and to provide time for the more basic and longer-term measures to take effect. Incidentally, the alternative possibility of lowering the Canadian exchange rate was rejected by the government at this time, partly because the problem was not one of lack of competitiveness of Canadian exports and partly because of its belief that price elasticities of the goods entering into Canada's foreign trade under the conditions then prevailing in world markets were such that a change in the par value of the Canadian dollar would have little effect.

Even though it was emphasized that the restrictions would be removed as soon as our reserves improved, it soon became obvious that the incidental protection which they afforded was having the effect of stimulating high-cost, uneconomic production of some of the goods subject to import control and introducing distortions and rigidities in the Canadian economy. Vested interests were being created and doubts began to be expressed concerning the merits of trying to follow liberal trading policies in a world of widespread restrictionism, discrimination, and inconvertibility. In a sense, the very basis of Canada's traditional trade policies was being questioned.

It was clearly realized, however, that if Canada was to continue to market her exports in the United States in large volume, it was essential to keep costs down, encourage productive efficiency, maintain competition, and retain sufficient flexibility in the economy to permit adjustments to the inevitable shocks of a dynamic and rapidly changing world. The government therefore decided to resist the pressures towards increased bilateralism. The emergency restrictions and discriminations were progressively eliminated as soon as our exchange reserves showed any perceptible improvement. The maintenance of a flexible economy was adopted as a positive purpose, and exporters who found themselves excluded from overseas markets were encouraged to find new outlets in dollar markets. The maintenance of a flexible, competitive economy would, it was felt, make the most out of the opportunities provided by the discoveries of new resources to which I

have referred and help to maintain conditions in which capital required for basic development could be obtained.

With respect to other aspects of our commercial policy during this period, the record reveals an equally determined effort to remove and reduce obstacles to trade wherever possible. Under the General Agreement on Tariffs and Trade, Canada made substantial tariff reductions in the course of three rounds of extensive multilateral negotiations. Despite some pressure, the Canadian dollar was kept at parity with the U.S. dollar until the 30 per cent devaluation of so many other currencies in September, 1949, forced the Canadian Government to revert to the former official rate of a 10 per cent premium on the U.S. dollar. In making this decision, however, the Minister of Finance was again quite aware that under current world conditions the "right rate" for the Canadian dollar at one time was unlikely to be the "right rate" at another, and that he might soon have to face again the problem of altering the official rate, with all the inconveniences and disturbances that these sudden and arbitrary changes create.

We had not long to wait. During the spring and summer of 1950, as our economic situation improved, a large and increasing number of people, both inside and outside Canada, came to the conclusion that the Canadian dollar was undervalued at the chosen official rate and, therefore, on top of a large inflow of investment capital interested in the development of our oil and other natural resources, we had an avalanche of speculative capital lured by the almost "sure bet" of an upward revaluation of our dollar. In ten weeks in the third quarter of 1950, our exchange reserves increased by over 500 million dollars. The flood, which of course increased the already strong pressures toward inflation, seemed to acquire momentum steadily. It was clear beyond peradventure that the existing rate could not be held. It was equally clear that in the unsettled state of world conditions—and having in mind the common pool of highly mobile capital serving our two countries—no one could pick some new fixed rate "out of the air" or select it by any theoretical equation and say with any assurance that that new rate could be maintained.

Forced off a fixed rate for the second time since the war's end, we had no choice but to leave the rate free to find its own level in the market. We explained our position to the Fund and they expressed understanding of it, although requesting us to keep the situation under review—which of course we would do in any case. Since that time (September 30, 1950), Canadian policy has been to allow the rate to be determined by the normal play of economic forces, without official intervention except to ensure orderly conditions in the exchange market. No attempt is made to hold back a trend in either direction

but only to smooth out excessive short-run fluctuations. After it was freed, our dollar rose sharply to U.S. \$0.95, hovered for a few months around the latter level and then began a persistent and almost uninterrupted rise until it reached par in February, 1952, and then a peak in August at the premium of over 4 per cent.

On December 14, 1951, the Finance Minister announced another bold conclusion to which the government had come; namely, that henceforth "we would be better advised not to rely on exchange restrictions but rather on the general handling of our domestic economic situation to keep it in reasonable balance with the rest of the world and to maintain the Canadian dollar over the years in an appropriate relationship with foreign currencies." The decision to let our dollar go free and particularly this new decision to abolish foreign exchange control completely were dramatic moves which apparently caused a great deal of interest on the part of foreign investors. The great influx of capital in 1950, amounting to over a billion dollars, had been to a very considerable extent of a speculative and short-term nature, though much of it stayed in Canada. While the capital inflow was smaller in 1951 (563 million dollars), it was of quite a different and more permanent character. Almost 300 million dollars went into direct investment in Canadian resources and industries and most of the rest represented borrowings by Canadians, chiefly provincial and municipal governments, in the New York market. These two types of inflow have continued in 1952, particularly the inflow for direct investment purposes.

It would be a mistake, however, to attribute the strength shown by the Canadian dollar during the present year to an inflow of capital. Such partial evidence as we have at this date seems to indicate that it is our balance on current account which has been responsible for the recent strength of our dollar. The change this year in our balance of trade has been quite extraordinary. In the twelve months ended in October, 1951, our imports exceeded our exports by 122 million dollars. In the twelve months ended in October of this year, our exports exceeded our imports by 235 million dollars. This net reversal of over 357 millions, with its consequent shift in the supply of and demand for Canadian dollars, has been, I am sure, the dominant influence on our exchange rate.

The invisibles in our current account are not likely to have shown any material change during the year, and so far as we can now see, capital movements must have been close to a balance. Certainly, if there has been a net movement either way, it must have been a small one. What has probably been happening is that the inflow of capital

for direct investment and as the result of public borrowings in New York has driven out a roughly corresponding amount of capital represented by U.S. holdings of Canadian marketable securities. It could not very well be otherwise, given the basic factors in the situation: (1) a favorable balance on current account, as we believe, probably not of large proportions; (2) a flexible exchange rate; and (3) a policy of not building up exchange reserves in order to stop an upward trend in the dollar. (In the first nine months of this year the increase was held to 77 million dollars.) Given a balanced current account, the inflow of capital, say, for direct investment tends to force up the Canadian dollar rate and thus to encourage the taking of profits by foreign investors who hold Canadian marketable securities bought when the dollar was at a substantial discount. This year, also, Canadians have probably increased their holdings of foreign exchange abroad.

That some measure of success has attended the efforts in Canada to achieve external as well as internal stability in a highly disjointed world is evidenced by the recent strength of our dollar, the present size of the exchange reserves (1,856 million dollars at September 30 last), the record level of foreign trade, and the unprecedented expansion of the economy. In some respects, of course, Canada has been especially fortunate in comparison with other countries. Our good fortune in being spared the direct ravages of war and in being blessed by Providence with rich and extensive natural resources has contributed in a significant way to the difficult postwar adjustments. The existence of alternative markets for many of our basic exports in the United States and the buoyancy of that market in recent years were also fundamental conditions of our relatively successful adaptation to the changing pattern of world trade.

However, the persistent imbalance of many of our important overseas customers has required us to make a number of difficult adjustments and confronts us with continuing problems. Markets for some of our minor agricultural products have been closed, with few alternatives in sight. Some manufactured goods have suffered sharp reductions in their sales to overseas markets. As long as our major overseas customers find it necessary to hedge themselves about with discriminatory trade restrictions and keep their currencies inconvertible, we shall have problems to solve and shall retain a measure of vulnerability because of our heavy dependence on one market, great and expanding as it is. We have therefore a great stake—as we believe does also the whole Western World—in the success of some such program of national action and international co-operation as was envisaged by the

recent London Conference of Commonwealth Countries, designed to recreate as quickly as practicable an effective system of multilateral trade and payments over the widest possible area.

If perhaps this record of developments in Canada since the end of the war has been tinged with some pride in Canada's recent growth and confidence in its future, I would like to warn you that we are worthy neither of the idolatrous esteem with which you sometimes seem to regard us nor yet of the low estate to which you consign us at other times in moments of disillusionment. We are just a young country trying to get along—with some of the strengths and limitations of youth!

There is nothing more certain in these dynamic and uncertain times than that we shall have fresh problems to face and new adjustments to make. Of these, the continuing disequilibrium in world trade and payments to which I have just referred and the constant threat of inflation arising from the cold war as well as from the impatient striving of a virile people for bigger and better things plus greater security and more leisure are likely to present the most compelling challenge. But there will probably be others as well.

Whatever the problems may be, the Canadian people will, I believe, face up to them with new confidence. We are small in numbers but growing rather rapidly. Our gross national product per capita is 27 per cent lower than yours but rising more rapidly. We are united as never before. That unity and a certain tolerance of mind and steadiness of purpose (call it stolidity, if you prefer!), coupled with inherited traditions and machinery, are enabling us to carry on the processes of democratic government effectively. At least from the economic point of view we are fortunate in our geographic position and in the dowry which nature has bestowed on us. During the last few years the foundations of our economy have been broadened, its productive capacity and diversification greatly increased, its vulnerability greatly lessened. We have been fortunate enough to develop a dynamic and flexible economy, gaining steadily in strength and adapting itself with remarkable speed to changed conditions and requirements.

All I can promise is that when the new problems come, Canadians will tackle them with a certain acquired skill in dealing with problems—and make, I believe, a pretty good “fist” of solving them.



## MONETARY POLICY

### RECENT DEVELOPMENTS IN BRITISH MONETARY POLICY

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Probably the most important—and certainly the most interesting—development in economic policy in Western countries during the past few years has been the revival of general credit control as a policy instrument—a revival associated with experience of the difficulties of controlling inflation by fiscal policy and physical and selective credit controls and with the conservative drift of public opinion since the end of the war, and deriving its recent impetus from the inflationary impact of the outbreak of the war in Korea. In many of the countries concerned, the trend has been towards the replacement of physical controls and selective credit controls by general credit restriction. In Great Britain, however, the revival of quantitative methods of credit restriction has been accompanied by the continuation and intensification of the qualitative methods of credit control previously employed; and the main effect of quantitative restriction as it has been applied so far has probably been to increase the effectiveness of the qualitative controls rather than to establish an alternative system of monetary management. The revival of quantitative methods has, however, cleared the way for the substitution of general for selective methods of monetary control, should the British government decide on such a step, while the higher interest rates and increased uncertainty generated by the change in policy have undoubtedly exercised a deflationary influence independent of the reinforcement of qualitative controls.

Prior to the changes introduced in November, 1951, British monetary management was devoted to the maintenance of cheap money; this was a continuation of wartime monetary policy, pursued partly to hold down the interest-cost of the war-expanded public debt and partly as a result of considerations connected with British conceptions of post-war economic planning. The technical means by which cheap money was maintained was the pegging of the rate on Treasury bills by the Bank of England at  $\frac{1}{2}$  per cent: after the failure of Chancellor Dalton's efforts to establish a rate of  $2\frac{1}{2}$  per cent on long-term government securities, the long-term rate was allowed to find its own level—within the framework of a controlled economy, of course—and from

November, 1949, to November, 1951, it fluctuated about  $3\frac{1}{2}$  per cent. The control of inflation was left to disinflationary budgeting, to direct government control over the substantial volume of investment by central and local governments and nationalized industries, to physical controls over certain construction materials, and to qualitative controls over private borrowing.

Qualitative control over private borrowing is exercised in two ways. First, share issues, new long-term borrowing, and borrowing from the banks require the approval of the Capital Issues Committee if the amount exceeds £50,000 in any one year; the Committee's decisions are guided by directives from the Chancellor, which set out a general list of priorities, and by the advice of the relevant government departments. Second, the banks are "requested" to conform in their lending policy to the directives issued to the Capital Issues Committee and occasionally apprised of supplementary guiding principles by letters from the Chancellor to the Governor of the Bank of England. Behind these requests lie the powers of control over the banks conferred by Clause 4 of the Bank of England Act of 1946 and the tradition of close bank co-operation with government established during the war; but there is no system for checking on the compliance of the individual banks, which have been left free to interpret the rules for themselves, although they can consult the authorities for advice in doubtful cases.

The policy of maintaining a low pegged rate on Treasury bills and relying on qualitative methods of controlling private borrowing resulted in no very serious monetary expansion in the period between the demise of the Daltonian policy and the beginning of the Korean war. While low short-term rates and the abnormal bank liquidity created by the wartime expansion of the floating debt and the postwar switch in Treasury short-term borrowing from Treasury Deposit Receipts to Treasury bills encouraged the banks to satisfy a rapidly expanding demand for advances by disposing of Treasury bills, and the looseness of qualitative control permitted them to do this while constantly affirming their co-operation with government policy, the expansion of advances was largely offset by repayment of floating debt out of budget surpluses. At the same time, uncertainty about the future of long-term rates, the uncomfortably long average maturities of bank investment portfolios, and the combination of the convention of valuing securities at the lower of cost or market value with investment portfolios large relative to reserves, made the banks extremely reluctant to switch from Treasury bills into investments; so that deposits increased only slowly during the period.

Following the outbreak of war in Korea, however, the weaknesses of the monetary policy just described became serious. The expansion of bank advances accelerated and the volume of domestic and foreign

bills of exchange coming forward for discount increased rapidly, while bank investments also began to increase. The result was a rapid increase in the money supply. In view of the expanding rearmament program and the adverse movement of the British terms of trade, this growth of bank lending constituted an undesirable inflationary development. During the winter of 1950-51, a severe reprimand was issued to the banks, which caused them to follow a noticeably more restrictive lending policy; in April, 1951, more stringent instructions were issued to the Capital Issues Committee; and in the summer of 1951 the banks were permitted or persuaded—it is not clear which—to raise their advances rates and other charges. At the same time, the banks and the discount market co-operatively took advantage of the growing supply of commercial bills to lever up commercial bill rates. But the pegging of the Treasury bill rate was continued, in spite of a growing volume of agitation by financial commentators and, it is rumored, by the nationalized Bank of England for the application of quantitative measures of credit restriction. The volume of bank advances and deposits continued to expand at a rapid rate, and this expansion obviously played some part in the deterioration of the British balance of payments in 1951.

In October, 1951, the Labour Government was replaced by a Conservative Government. The first task of the new Chancellor was to cope with the balance-of-payments crisis. As in previous crises, the main reliance of government policy was placed on import restrictions and reductions in domestic investment. Import restrictions were imposed in November and after the Commonwealth Prime Ministers' Conference in January; the policy of cutting investment was announced in the Budget Speech in March, its specific object being to divert engineering products from domestic use to exports, and the measures taken at that time have since been supplemented by the stretching and reshaping of the defense program. The new feature of economic policy under the Conservatives, however, has been the application of general measures of credit restriction.

The change in monetary policy was announced by the Chancellor on November 7, 1951, in terms which cast monetary restriction for a modest role as a supplement to other anti-inflationary measures. The restoration of control over the money supply was accomplished by two measures. The first was the termination of the Treasury bill peg and the restoration of initiative in the bill market to the Bank of England. Simultaneously, the Bank rate was raised from 2 per cent—at which level it had stood, except for two months at the beginning of the war, since 1932—to  $2\frac{1}{2}$  per cent. This was a symbolic change only, though important as such, since a new rate of 2 per cent for seven-day loans by the Bank of England on the security of Treasury bills was intro-



duced, which would be the operative penalty rate, and since in any case the availability of cash would be determined by the use which the authorities made of the Bank of England's new initiative in open market operations in Treasury bills. In the event, this initiative was used to raise the Treasury bill rate to around 1 per cent and to break down the rigid structure of discount market rates which had been established around the Treasury bill peg.

The second measure was the funding of a substantial proportion of the outstanding Treasury bill issue into short bonds. This was achieved through the offer of £1,000 million of  $1\frac{3}{4}$  per cent Serial Funding stock, maturing on November 14, 1952, 1953, and 1954, in exchange for Treasury bills with not more than sixty days to run, the bills being accepted at the previous  $\frac{1}{2}$  per cent rate. The terms of this offer were aimed at the banks, which hold the shorter maturities of Treasury bills, and it is generally understood that the banks were instructed to subscribe for half the stock, individual subscriptions being proportional to deposits; at any rate, this was their response to the offer. The effect of the funding was to reduce the aggregate liquidity ratio—cash, money at call and short notice, and bills discounted as a percentage of deposits—of the clearing banks from 39 per cent in October to 32 per cent in November. This brought the liquidity ratio close to what has since been officially described as "the conventional minimum of 30 per cent" (*Economic Survey for 1952*, page 43). There is in fact almost no evidence that British banks historically governed their policy by such a secondary reserve rule, and the theory that they did seems itself to be a construction of the latter thirties; but since the funding, the principle has been affirmed by the statements and actions of the banks themselves—possibly as a result of suggestion by the monetary authorities—and, given the principle, the effect of the funding was to remove the previous incentive to the banks to expand advances by disposing of Treasury bills far more effectively than did the raising of the Treasury bill rate to 1 per cent. Thereafter, so long as the Treasury could hold down the Treasury bill issue—which the seasonal revenue surplus permitted it to do from December to April—expansion of advances would oblige the banks to dispose of investments, at little net gain to themselves and without expanding total deposits.

The uncertainty generated by the increase in Bank rate, the ending of the Treasury bill peg, and the threat of bank sales of investments implied by the funding produced reactions in the gilt-edged and new-issues markets. Interest rates rose to a level of  $4\frac{1}{4}$  per cent on long-term government securities, while a number of new capital issues were left in the hands of the underwriters.

The restoration of monetary control was followed by a stricter

application of the qualitative methods previously employed. The banks were apparently told to tighten up their advances policy, and took the unprecedented step of publishing a warning to the public that "requests for advances will be more and more critically examined and that bank borrowing will tend to become more expensive" and a request to refrain "from asking for any advance which is not for an essential purpose." A new directive to the Capital Issues Committee defined more clearly and positively the projects to be encouraged and discouraged and instructed the Committee to supervise the period of borrowing and the repayment arrangements of applications for advances normally referred to it. In applying this instruction, the Committee has emphasized early repayment of the loan. The new directive was accompanied by a "request" to the banks "that notwithstanding the statutory exemption of borrowings made in the normal course of business, bank advances should not in general be made for capital expenditure"—a principle which closed a loophole in the previous administration of control over capital issues. A Board of Trade Order was issued, regulating the terms of installment buying of a wide range of goods, and in May this was supplemented by a directive to the banks to reduce finance for installment buying by 10 per cent by September.

The effect of the introduction of a modestly contractionary monetary policy and the tightening of qualitative controls was a marked toughening of the lending policy of the banks, as well as a tightening of conditions in the gilt-edged and new-issues markets. The expansion of advances was sharply checked during the period November to February, and their composition changed in conformity with the new principles of qualitative control. The banks also became sellers instead of buyers of investments.

Meanwhile, the balance of payments failed to improve and the reserves continued to run out rapidly; the loss of reserves was accelerated by speculation on a further devaluation of the pound. It was generally expected that the problems of the balance of payments and rearmament would lead the Chancellor to introduce a strongly disinflationary budget. Instead, the main purpose of the Budget was redistributive, and much greater reliance than before was placed on monetary restriction as an instrument for controlling inflation. The Bank rate was raised to 4 per cent, and the seven-day loan rate to  $3\frac{1}{2}$  per cent, with the dual purpose of restoring confidence in the pound and helping to improve the balance of payments and of administering a further warning to domestic lenders and borrowers of the need for economy. Following the raising of Bank rate, market rates on Treasury bills rose to a  $2\frac{1}{4}$ - $2\frac{1}{2}$  per cent level; but while short and medium bond yields rose, there was little reaction on long-term rates.

So far as its external effects are concerned, the increase in Bank

rate and discount rates undoubtedly played a large part in inducing the influx of capital which ensued on the Budget Speech, although the conviction that the pound would not now be devalued may have been more important than the influence of higher interest rates on short-term international capital movements. Since March, too, the supply of commercial bills has been steadily falling (clearing bank discounts of such bills have dropped from £187 million in February to £61 million in October) and this implies an appreciable reduction in British short-term foreign lending. It is impossible, however, to say how much of this reduction is due to higher interest rates, how much to the qualitative restriction of overseas credits extended by London banks and acceptance houses which was applied at the time of the Budget and which confined such credits to ninety days' tenor and to the finance of goods in actual movement, and how much to the effects of Commonwealth import restrictions, world recessionary tendencies, and falling raw material prices in reducing the demand for such finance.

Internally, the effect of the increase in Bank rate was to narrow the gap between the Treasury bill rate and the rates on long-term government securities and advances. The wideness of this gap had been a potential source of weakness during the earlier stage of the use of monetary policy, just as in the days of the pegged rate, since it maintained the interest-incentive for the banks to switch from bills into advances and made the effectiveness of monetary restriction dependent on the firmness of the 30 per cent conventional minimum and the ability of the Treasury to keep down the floating debt.

Since the second increase in Bank rate, bank advances have decreased substantially, falling from £1,946 million in March to £1,747 million in October. Partly this reflects the decline in British production due to the recession in the demand for consumer goods and the reduction of exports by import restrictions abroad and partly it is the result of repayment of bank advances from new capital issues; partly, however, it is the effect of quantitative and qualitative credit restriction. The composition of aggregate bank advances has also changed in conformity with the priorities laid down by the Chancellor: personal and professional advances and advances to the food, drink, and tobacco industries and to retail trade have been sharply reduced, while advances to engineering and the iron and steel trades have increased. Net deposits, however, have increased by £245 million between March and October. This is entirely due to the financing of a large government deficit by borrowing from the banks—a deficit which is partly due to the government's enlarged housing program.

The financing of the mounting government deficit by larger issues of Treasury bills led to increases in the banks' liquidity ratio, which by September had risen to 38 per cent—almost what it had been be-

fore the Treasury bill funding of the previous November; by that time, too, the banks' holdings of the first block of Funding stock had become the equivalent of bills. The fact that bank advances continued to fall in spite of this substantial increase in bank liquidity strongly suggests that an important part of the responsibility for the tightening of credit conditions in Britain during the past year must be attributed to the stricter application of qualitative methods.

The first block of Funding stock issued in November, 1951, was to mature on November 14; at the end of September the Treasury made an offer for the conversion of this stock and the  $2\frac{1}{2}$  per cent National War Bonds, 1951-53, into the 1953 and 1954 Funding stocks and a new 3 per cent Funding stock, 1955, at the same time offering all three of the latter stocks for new cash subscriptions. The significant feature of this conversion was that it was taken for granted that the banks would convert all their holdings of the 1952 Funding stock; beyond that, they were "persuaded" to subscribe for extra stock to the extent required to reduce their liquidity ratios towards 34 per cent, individual subscriptions being proportional to liquidity rather than to deposits as in 1951. These subscriptions were financed by official purchases of Treasury bills on behalf of the Treasury, at the current market price. Most of the reduction of bank liquidity achieved by this means will be replaced by March 1, when the National War Bonds are redeemed; but by that time the seasonal budget surplus will be putting strong pressure on bank liquidity ratios.

What conclusions emerge from this survey of recent developments in British monetary policy? In the first place, the restoration of quantitative methods of credit control has not been the simple return to orthodox techniques which some commentators have made it out to be. A penalty rate  $\frac{1}{2}$  per cent below Bank rate and a normal dealing rate about 1 per cent below that, with the availability of cash depending on the extent to which the Bank of England is prepared to enter the market at the going rate, bear little resemblance to traditional Bank rate technique—although it is probably more flexible and certainly more adaptable to the facilitation of Treasury debt operations. Nor is reliance on an arbitrary liquidity rule, defined by the names rather than the nature of the banks' assets and brought into play by forced fundings of bank holdings of Treasury bills into short bonds, by any means a traditional technique. On purest principle it might not even pass as a technique of quantitative credit control.

Secondly, the revival of quantitative methods has not been a substitute for other methods of credit control. General credit restriction has been accompanied by more vigorous application of qualitative controls, and in spite of the raising of interest rates the general character of British monetary policy remains one of discrimination—discrimina-



tion in favor of the government as against other borrowers and discrimination between private borrowers on the basis of priorities determined by the government. In the case of bank advances—the sector which the monetary authorities seem to have been most concerned to influence—the chief result of credit contraction has probably been to increase the effectiveness of qualitative controls by inducing the bankers to rely on the official instructions as an excuse for refusing applications for loans instead of trying to interpret them in the customer's favor. In the new-issue market, however, where the increased uncertainty and stiffer terms of lending resulting from credit restriction have had a marked effect on the demand for finance, independently of the tightening of qualitative controls, the results may well be less consistent with social priorities.

Thirdly, although the general effect of the revival of quantitative credit control has been to furnish an iron glove to fit the velvet hand of qualitative controls, the measures which have been taken have prepared the way for a genuine return to quantitative methods, should the government in future desire it. They have done so by shaking loose the rigid structure of money market rates characteristic of the preceding twelve years and accustoming the discount market and the banks to fluctuating short-term rates. In the way of such a return to reliance on quantitative methods, however, is the inhibiting influence of a large volume of floating and short-term public debt and the general British philosophy of government intervention.

Finally, while the simultaneous application of quantitative and qualitative credit restrictions and the emergence of deflationary tendencies this year prevent the drawing of any firm conclusions, recent British experience probably supports the view that monetary restriction can have a significant effect on economic activity without requiring a very substantial rise in interest rates. The effect, however, comes through the generation of uncertainty and the tightening of the terms on which lenders are willing to lend rather than through a high interest-elasticity of the demand for credit; and it leaves open the questions of the efficiency and the reliability of the method. In an economy which has other policy objectives besides the control of inflation, there is always the possibility that uncertainty and credit rationing may interfere seriously with the attainment of these other policy objectives. Again, the effects of monetary restriction may be very different under different circumstances, in ways difficult to predict. It is possible, for example, that much of the effectiveness of the revival of monetary policy in Britain has been due to the dramatic reversal of a long-standing policy of cheap money and could not now be repeated.

## RECENT MONETARY POLICIES IN THE UNITED STATES<sup>1</sup>

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We can look back today on close to two years of the relatively free monetary policy. This is not enough time for a definitive appraisal, but sufficient perhaps for some interim observations. It is fortunate that during the period the Federal Reserve and Treasury have not had to face violent swings in the economy. With such, monetary policy probably would have found it difficult to cope. What we have experienced are mild alternating tendencies toward inflation and deflation, with a good deal of inherent stability in the economy. That these alternating tendencies did not acquire cumulative force, however, is after all an achievement. For it, monetary policy may claim part of the credit.

Perhaps such value judgments on monetary policy would appear with better justification at the end of this paper than at the outset. It is not my intention, however, to attempt an appraisal of the monetary policies of the last twenty months in the light of their results, except rather implicitly. The main purpose of this paper is to analyze some of the major policies and to study some of the unresolved issues relating to the *modus operandi* of monetary management. This will appropriately reflect, I hope, the balance of interest in the field, which seems to have been divided between the actions of the Federal Reserve and Treasury on one side and the writings and discussions called forth by the Patman inquiry on the other.

Since the Patman inquiry will receive detailed attention elsewhere,<sup>2</sup> I shall not trespass on that preserve. And since one major policy action—the unpegging—has already received such detailed scrutiny in the Patman literature, I shall make no attempt here to add to the existing body of discussion. Within these restrictions, I should like to survey three important areas of recent policy, which will occupy the first part of this paper. They are: (1) the policy of “neutrality,” which has been the keynote of Federal Reserve action in the field of economic stabilization; (2) the “reconditioning of the market,” which the Federal Reserve has carried on, including the rehabilitation of the discount

<sup>1</sup> I am indebted to my colleague, James Tobin, for a great deal of helpful discussion during the writing of this paper.

<sup>2</sup> The two round table sessions of the American Finance Association on “The Patman ‘Text-books.’” These papers will appear in the May, 1953, *Journal of Finance*.



rate and the borrowing mechanism; and (3) Federal Reserve support of Treasury financing.

I realize that this is not a complete list of topics, and I must hope that the limitations of time will be accepted as an excuse for selectiveness.

1. *Neutrality.* The basic idea of a neutral monetary policy seems to be simple and, in fact, self-explanatory. It suggests a policy which is appropriate to a situation without major trends in either direction and which seeks to stabilize the existing approximate equilibrium. Whenever such an equilibrium exists and shows itself to be inherently unstable, the policy makers have, conceptually, two alternatives. One is to wait until a disequilibrating trend becomes apparent and then to combat it aggressively. The other is to re-create an automatic monetary system analogous to what would exist in the absence of monetary powers. Within this system, some reliance can be placed upon the natural easing and tightening of the financial markets in response to incipient trends; i.e., upon the self-correcting tendencies of the system. The second approach would be, ideally, a neutral policy. The distinction thus formulated may help to bring out the essential nature of neutrality, although for practical purposes it greatly overstates the difference between the two alternatives.

*The Difficulty of Remaining Neutral.* In practice, the re-creation of an automatic system does not mean that all credit facilities of the Federal Reserve except the discount window are closed down, leaving the volume of bank reserves to be determined entirely by market forces. Too many random and seasonal factors would enter into this determination. The great difficulty of conducting a neutral policy lies precisely in identifying those reserve movements and needs that are random and seasonal, those that are occasioned by economic growth, and those that reflect a trend away from equilibrium. Random increases or reductions in revenues should be offset; i.e., they should not be allowed to ease or tighten the market. The same problem applies to seasonal movements, but with less assurance. A case can be made for permitting some seasonal easing and tightening of the market, because a seasonal move may, as it has sometimes done, conceal the beginning of a cyclical trend. The effects of real growth likewise should not be allowed to tighten the market. Disequilibrating trends, however, should be allowed to have their effect upon reserves, so as to call forth the self-correcting forces.

In summary, neutrality requires considerable activity on the part of the Federal Reserve, and it is not surprising if both concept and activity are interpreted differently by different observers. Positive action probably would differ from neutrality mainly in the following

respects: substantial increases in the supply of excess reserves, plus a reduction in discount rate, if a serious slump seemed to threaten; and a gradual but very reluctant yielding of ground, plus a higher discount rate, should boom tendencies develop.

*Results of Policy.* A statistical investigation of the results of neutrality in terms of money and banking data is difficult and perhaps not very meaningful. Most of the relevant series have gone up substantially since the "Accord"; somewhat less so during the last twelve months. This is true, for instance, of member bank reserves, total deposits plus currency, and loans, as well as Federal Reserve bank credit and holdings of government securities. Adjusted demand deposits have been relatively stable. This, however, does not imply stability in the money supply, since corporate holdings of bills, a close money substitute, have increased, while savings deposits have also risen. In this connection, nevertheless, one must bear in mind the slowing up in the velocity of corporate balances that results from the Mills Plan. The need for seasonal accumulation of funds under the Plan probably justifies some increase in corporate money and near-money holdings.

Does the predominantly upward tendency of the data mean that recent monetary policy has allowed an undue expansion of money and credit? This would imply a question regarding the appropriateness of a neutral policy. Perhaps at times it should have been more vigorously restraining. One must add, however, that under the banner of neutrality very considerable restraint has been engendered, driving the bill rate at times above 2 per cent. Our difficulty in appraising the significance of the monetary expansion that has taken place is that we have no well-developed standards of judgment. Some monetary and credit expansion surely is necessary in an economy in which real output has been rising. Wholesale prices have been going down for many months, although consumer prices have continued to rise. The general atmosphere has fluctuated between threatening inflation and threatening deflation; but neither threat has materialized. Looking at the economy as a whole, we have enjoyed a high degree of stability with rising output. In other words, the main goal of economic policy has been approximately attained.

If it is accepted that the economy has been approximately stable and that the monetary expansion has not been excessive from this point of view, it would be possible to ask several further questions. One is whether the elasticity of our economy is so great that, in the absence of extreme pressure or panicky operations, a little more or a little less monetary pressure can be absorbed without much change in prices and employment. Another is whether we need a certain amount of monetary expansion over and above growth requirements merely

in order to remain stable. These questions cannot be answered on the basis of twenty months' experience.

Neither question, however, implies serious doubt as to whether or not recent monetary policy has made a contribution to stability. If we contemplate what might have happened if instead of pursuing its neutral policy the Federal Reserve had continued to peg the bond market, we get one possible measure of this contribution. We would almost certainly have had more inflation during at least part of the last twenty months. This seems to be a fair guess in view of the expansionary pressures exerted at certain times by rising output and low unemployment. In reaching this judgment, it is worth observing, perhaps, that it emphasizes the restraining phases of neutrality as against the rarer moments of stimulation. This seems appropriate: neutrality has been mainly restraint. Recent experience bears testimony mainly, therefore, to the restraining power of monetary management, not to its power of stimulation.

2. *Reconditioning of the Market.* The policy of neutrality has served a second purpose, not directly related to the monetary effect of neutrality. It has provided a setting for the Federal Reserve's effort to "recondition" the market. By this I mean the establishment of a market that is self-supporting and sensitive to economic forces, and the reintroduction of borrowing and the discount rate as major market forces. This reconditioning of the market has been an important aspect of monetary policy since the Accord.

*The Need for Reconditioning.* Before the Accord, two main features of the market were (1) its heavy dependence upon the Federal Reserve and (2) the loosely held character of large parts of the public debt (which diminished toward the end of the period). The two factors were related, of course, the debt being held in many cases only in the expectation that it could be shifted to the Federal Reserve. With the unpegging that followed the Accord, the market became in a measure self-supporting and able to move in response to economic forces instead of in response to Federal Reserve operations. The debt came to be more firmly held at its new price level, although there must still be many reluctant holders. The new situation was a great step forward, because it terminated the "open-end" commitment of the Federal Reserve to the market. But much remained to be done. The market (as well as the Federal Reserve and the Treasury) had to gain experience with the movement of interest rates, reserves, loans, and securities in a market influenced mainly by economic forces. Both sides had to learn how far Federal Reserve action to help the market—or the Treasury—would be necessary or could be counted upon. Many policy actions of the Federal Reserve seem to have had this recondition-

ing as a secondary goal, and the neutrality policy provided a helpful background.

*The December, 1951, Episode.* The working of this educational process is illuminated by various episodes that have taken place since the Accord. By way of illustration, I shall briefly describe a particularly dramatic one, which provides several lessons. In the last two weeks of December, 1951, the market became exceptionally tight, owing to the pressure of various seasonal factors. Borrowings from the Federal Reserve were high, and the tightness was intensified by the efforts of the borrowing banks to pay off before statement day. It seemed to be expected by many that the Federal Reserve would enter the market with purchases in order to relieve it. This expectation seemed all the more justified because the scarcity of funds threatened to push the ninety-day bill rate substantially above the discount rate. This, it was thought, would weaken the reluctance to borrow, and hence was regarded by many as an event that the Federal Reserve would wish to avoid. But the bill rate crossed the discount rate at  $1\frac{3}{4}$  and continued to increase to 1.93, without any of these expectations being fulfilled. It was only at the very last moment that the Federal Reserve intervened with substantial purchases to relieve the situation.

What are the lessons of this experience? One lesson relates to the degree to which the Federal Reserve was willing to let the market tighten before intervening. Some observers were critical of this since the tightening was largely seasonal. Another relates to the way in which the bill rate was able to rise above the discount rate without loosening a flood of borrowing, demonstrating the banks' continued reluctance to borrow. This second lesson was qualified, however, by the approaching statement date, which undoubtedly increased the aversion to borrowing. A third lesson was the difficulty, under year-end conditions, of attracting corporate funds into bills. That the experience made an impression is shown by the way in which the market is reported to have been preparing for tightness at the present year end. This has caused tightness to set in earlier than last year, which has been desirable in view of the current more than seasonal loan expansion.

*Limits and Potentialities of a Self-supporting Market.* Why is it that a market governed by natural forces instead of by guesses about future Federal Reserve action is so desirable? Cannot the Federal Reserve produce any kind of effect that economic forces can? The answer is that while the Federal Reserve can produce the same ease or tightness that economic forces produce, it cannot generate the same expectations and responsive actions. In a market governed by economic forces, people plan and act under stimuli that are to some extent foreseeable. In a Federal Reserve dominated market, this is not the case. Further-



more, the movement of a market governed by natural forces normally tends to be in the right direction—restraining when the economy expands, easing when the economy contracts. If the market is dominated by expectations regarding Federal Reserve action, this need not be the case. The Federal Reserve then cannot even rely upon the market as an indicator on which to base its policy.

In sum, by promoting a self-supporting market, the Federal Reserve can to some extent make market forces do the work of monetary policy. This is the kind of automatic system upon which a neutral policy relies. Even under other circumstances, it may be preferable for the Federal Reserve to have tightness come through market forces instead of by its own action. There is always the danger that too severe policy action may paralyze the market. Buyers might be scared away if the Federal Reserve became too aggressive a seller, and in the end it might then have to put larger amounts of funds into the market to overcome the consequences of its own action. Thus self-correcting action of the system may at times be more effective than what the Federal Reserve could safely attempt to do with its policy instruments.

But it is dangerous to idealize the self-regulatory possibilities of a self-supporting market. In the first place, the market can never completely shake off all speculation regarding future Federal Reserve action. The interventions of the Federal Reserve to offset seasonal and random disturbances are too frequent for that. In this sense, therefore, the market can never be completely self-supporting. In the second place, there are limits to the blessings that can be expected to flow from self-regulation. Even though the impulses generated by an automatic system are in the right direction, they are not likely always to be of the right strength. One can readily understand that after the extremes of intervention in which the Federal Reserve had been engaged during and after the war, there is a strong desire to move back toward greater reliance on market forces. The question is where to find the happy mean.

*Borrowing and the Discount Rate.* The revival of borrowing by member banks has been the most conspicuous part of the reconditioning process. The level of the discount rate and the possibility of changes in it are regaining their old role as major policy instruments. To re-educate the market in the proper use of borrowing facilities is one of the important tasks in which the Federal Reserve has been engaged. To develop the potentialities for policy inherent in the control of borrowing is one of the main challenges it faces.

What are the advantages for monetary control, of supplying reserve funds via the mechanism of borrowing? Could not the Federal Reserve regulate the volume of its credit equally well via open market opera-

tions? The peculiar virtue of Federal Reserve credit supplied via borrowing seems to be twofold. In the first place, the mechanism allows the market to indicate the volume of reserve funds that it wants. The Federal Reserve is not compelled to make a judgment. In the second place, and more importantly, an automatic device is provided for getting the funds back out of the market once they are no longer required there. Banks are under pressure to repay, and they will manage their portfolios so as to be able to repay.

If the funds had been put into the market via open market purchases, the Federal Reserve could, of course, get them back by sales. But if the banks were not counting on this reversal, they might have put these funds to some fairly firm employment. There might be no funds available to absorb the sales by the Federal Reserve. Thus the reversal of an open market operation would probably have more of an impact on rates and create more disturbance in the market than if the same operation were performed through the discount window. The device of repurchase agreements with dealers seems to have become increasingly popular with the Federal Reserve as a substitute for ordinary open market operations precisely because it provides for an automatic return of funds. The difference in the effect upon interest rates of different methods of supplying funds points to certain peculiarities in the relation between the volume of funds available and the interest rate, which will be taken up in detail in the second part of this paper.

A third advantage of the borrowing mechanism—of a somewhat different order—is the interplay between borrowings and open market operations, which became familiar during the twenties. By means of its open market operations, the Federal Reserve can bring about whatever volume of borrowing it likes to see, within the limits of the reserves required by the market. It can thus control the pressure that the market imposes upon itself through its desire to pay off.

Another way of observing the special advantages of borrowing, from the point of view of monetary control, is to note its relationship to two other forms of Federal Reserve credit. Borrowing stands in the middle between two extremes: the complete lack of Federal Reserve discretion implicit in a pegged government securities market and the absolute discretion of free open market operations. The fixed discount rate constitutes a pegging of the notes that bankers offer to the Federal Reserve. But the restraints connected with borrowing limit the extent to which banks are likely to take advantage of this pegged price for their notes.

Much of the usefulness of the borrowing mechanism depends, of course, on the continued reluctance of banks to be in debt to the Federal Reserve. How far can one rely on this reluctance? Bank tra-



dition works against borrowing; and so does the discipline imposed by customers who read bank statements. But borrowing now is specially advantageous for banks in the excess profits tax bracket. The changed climate of business and banking and the growing custom of borrowing in itself may be relaxing the discipline. Besides, window dressing on statement day is often possible through overborrowing and averaging of daily reserve figures. It is said by some observers that the reluctance of many banks is beginning to wear thin.

There are means, however, of coping with this situation. For one thing, the Federal Reserve can raise the discount rate. In that case, the banks that borrowed instead of selling short-term securities will find the latter going down in the market, and will be sorry. An experience of this kind would no doubt help to revive reluctance. More important, perhaps, is the fact that borrowing is not a right but a privilege. That was realized even during the twenties; but then there were serious questions about standards by which the Federal Reserve could limit this privilege. Today we have better information and, perhaps, a better understanding of the problems involved. Some bankers say that the Federal Reserve has already been moving in that direction. Through pressure to pay off—or perhaps even outright refusal—the Federal Reserve could carry its control of borrowing far beyond the power given to it by “reluctance.” The elaboration of this power is one of the most challenging prospects for the Federal Reserve today. Admittedly a move in this direction is a step toward a more selective and administrative credit control, away from the ideal of a completely indirect control. It seems a small step, however, that remains well within the framework of general credit policy.

Besides the possible weakening of the reluctance to borrow, there is another potential loophole. By denying credit to the market, the Federal Reserve is by no means cutting off the banks from all sources of funds for loan expansion. The banks still can sell securities to non-bankers as they did on a large scale after the flotation of the 2 $\frac{3}{8}$  per cent issue this summer. For the banking system as a whole this creates only a fraction of the excess reserves that a sale to the Federal Reserve generates. For an individual bank, however, it makes no difference who the buyer is (unless the bank has the misfortune of selling to one of its own depositors). Thus banks will borrow only as long as that is less costly or otherwise less unpleasant than to sell. If the Federal Reserve makes borrowing very unpleasant, the banks can escape its control by selling.

How big is the gap that this possibility leaves in the Federal Reserve armor? This depends upon the factors that can be counted upon to restrain the banks from selling. Among these are the attractiveness of

security yields in relation to loan rates; the existence of book losses; the desire to hold a certain volume of short-term securities as secondary reserves and of longer terms for portfolio balance; and the price uncertainty which makes in-and-out trading risky. Several of these are themselves subject to Federal Reserve influence.

In the aggregate, the amount of selling that the banks could do would be limited, of course, by the volume of funds that nonbanks have available for investment. Since this includes corporate balances that can be put into short-term securities, the volume of such funds is very great. The operation resembles, in its monetary aspects, the "loans for the account of others," by means of which the banks activated customers' balances during the twenties and which since have been prohibited.

It is true that the Federal Reserve could counteract any expansion of bank credit financed in this form by appropriate open market sales. So far, however, the Federal Reserve has seemed reluctant to become an aggressive seller of government securities, presumably because of possible repercussions upon the market and upon Treasury financing. If this reluctance remains strong, the power given by control over borrowing could be weakened by shifts of bank-held securities to non-bankers. However, the factors that inhibit such sales (which I have outlined before) are probably sufficiently strong to prevent wholesale shifts under ordinary conditions. In a strong boom, they might not be sufficient by themselves, but they would then be re-enforced by the increased cash needs of corporations and a correspondingly reduced willingness to buy short-term securities from banks. Moreover, the Federal Reserve, under such conditions, might be willing to resort to the countermeasures available to it. Thus, while the danger that an increase in velocity might frustrate control over the quantity of money is a real one, we are not without defense against it.

3. *Aid to Treasury Financing.* Even after the Accord, most Treasury financing operations have received some degree of Federal Reserve assistance. The weekly portfolio record of the Reserve Banks shows this clearly; and no doubt there are intra-week transactions and switches within portfolio categories that are not visible in the record. Of course, this assistance has been different in character since the Accord; it has been much more flexible. The Federal Reserve has employed a variety of techniques to minimize the monetary effects while such operations are going on and to get the money back out of the market as soon as they are over. It also seems to have combined aid to the Treasury with open market purchases undertaken for seasonal reasons. Nevertheless, some interference with monetary policy has been inevitable. Why is it that despite the co-operation that has prevailed between

Treasury and Federal Reserve this problem has not been overcome?

Two major reasons may be suggested. One is the size of the financing operations—usually refundings. Securities transactions running into billions may be just too large to be handled without some extra liquidity to grease the financial wheels. The second reason is a little less obvious and more complex. During most of the period since the war the demand for capital has been intense. Interest rates have been slow to reflect this—for reasons that will be discussed in the last part of this paper. The equilibrium rate for most of the period probably would have been well above prevailing levels. The stabilizing function of a higher rate has been performed, in a sense, by the rising tendency of rates. But at many times this must have meant a slight imbalance in the capital market, a weakness on the supply side, that may have been more noticeable in large operations than in small, and in the highly liquid and sensitive government market more than in the corporate market. This suspended disequilibrium may have contributed to the need for Federal Reserve support of Treasury operations.

Insofar as these considerations carry weight in connection with debt management, they seem to suggest primarily the desirability of pushing out some of the short-term debt to longer maturities. This would reduce the volume and frequency of refundings. Secondly—but this is a very tentative conclusion—it may turn out that a somewhat higher but stable level of rates, if that should come about, would be no more of a drag upon the economy than the gradual uptrend that we have been experiencing.

4. *"Availability" versus Interest Cost.* One fact stands out about monetary policy since the Accord: whatever it accomplished was accomplished with very modest fluctuations in interest rates. The longest term bonds moved within a range of 2.45-2.81 per cent, and for ninety-day bills the range did not exceed 1.36-2.26 per cent bid. One is driven to conclude that insofar as monetary policy was effective, it must have worked not only through interest rates but through other factors. Recent experience therefore bears directly upon the familiar question of the relative roles played in monetary management by the interest rate and by "availability" of credit.

*Some Questions About the Availability Doctrine.* In the Patman literature, as well as in other writings, considerable stress is placed upon the doctrine that the availability of credit is more important than its cost. This stress seems to have a twofold root. In the first place, the observed effectiveness of monetary policy on past occasions is hard to explain in terms of small changes in the cost of borrowing—this all the more in view of what inquiries have brought to light about the businessman's seeming indifference to this cost. In the second place,

however, unless it could be demonstrated that monetary management could be made effective without wide fluctuations in rates, through changes in availability, the prospects for free use of monetary policy seemed rather remote. This is not, of course, an altogether unbiased form of reasoning. To those, therefore, who are inclined to cast aspersions upon the doctrine, its background offers some ammunition.

During the Patman hearings, however, a witness whose general attitude toward monetary policy seemed to be one at least of benevolent neutrality raised some searching questions regarding the availability doctrine. I am referring to the testimony of Paul Samuelson. Professor Samuelson pointed out that what was loosely referred to as "reduced availability" of credit really involved a change in the degree of imperfection of the market. If bankers curtail their loans without raising interest rates, they are engaging in rationing or, better, in more rationing than usual. Is it likely, Professor Samuelson asked, that bankers will continue this intensified rationing indefinitely, at some sacrifice in profits? Or must one expect them to return to the usual degree of market imperfection, raising rates sufficiently to reduce demand for loans to the desired level? In that case, it would ultimately be the rate and not availability that curtails borrowing.

*The Modus Operandi of Availability.* This question raises a point about monetary policy that seems to be quite basic. It is basic to monetary policy in general and particularly important to the kind of policy that is now being conducted. In order to discuss it, I think it is necessary to distinguish the various ways in which a change in availability makes itself felt. In this context, I want to make clear that I do not see the issue between availability and interest cost as an "either or" but as one of more or less. Three main aspects of availability seem to be involved. First, there is the rationing of customer loans, without a corresponding increase in rates, that is believed to be practiced by bankers when the Federal Reserve tightens up on bank reserve positions. Second, there is the lull in the new-issue market that is believed to be the typical response to a small decline in security prices, as underwriters and investors back away from new issues. This effect is dynamic in character and is the reverse of the familiar liquidity preference relation, according to which a rise in interest rates produces an increase in demand for securities. It does, of course, but only over a period where short-run effects cease to be operative. Third, there is the "pin-in." A small decline in security prices tends to make investors unwilling to sell, and this reduces the availability of funds for new ventures through the shifting of existing holdings. For this last effect, some rate change is of course a prerequisite. Large institutional investors, however, who could not sell governments without depressing



the market, may be pinned in effectively even by the fear of this result. Note also that the backing away from new issues and to some extent the pin-in are in the nature of "impact effects." This may wear off unless revitalized by new policy action. The importance of the pin-in and the potency of the initial impact effect were both demonstrated by the unpegging in the spring of 1951, particularly in the mortgage credit field.

Granted that for a limited period—a few weeks or perhaps a few months—credit can be significantly tightened with only a small increase in rates, two questions must be faced. How long can the market remain in this state of suspended disequilibrium? How high will the rate have to go to reach equilibrium?

*Imperfect Competition.* The tightening with only minor rate increases probably lasts longer in the market for customer loans than in the new-issue market. The price for customer loans is an administered price. Its movements are subjected to the inhibitions typical of oligopolistic markets. Observation of competitor action, resistance to variation unless the new level looks fairly stable, and reluctance to create cost differentials between outstanding and new loan contracts are among the built-in restraints of the situation. An example of this was the long gestation period, late last summer, of what was expected to be an increase in the rate charged by New York banks on prime loans. After several months of press speculation suggesting that this move was being considered, the rate finally remained unchanged, reportedly because there was fear that a  $3\frac{1}{4}$  per cent rate would not prove permanent. Thus a tight situation may continue for some months with little or no change in basic rates.

One may interpret this as the behavior typical of an imperfectly competitive market, not fundamentally different from the steel or automobile industry. It would be different only—as Samuelson has pointed out—if the situation should continue indefinitely. Experience confirms analytical reasoning in demonstrating that this is not likely to be the case: under the pressure of continuing tightness, rates are likely to move up eventually, as they have since the Accord. This at any rate is true of rates quoted by major banks to important customers. For many lesser customers and in small country banks, rates have been observed to possess an almost unbelievable stability. There the interest rate appears to be not so much a price as an integral part of a business relationship. But with regard to the customer rates that do move, the question is: how high must they ultimately go?

*Potential Rate Increases.* If rates must rise to a level at which the interest cost of borrowing alone discourages the credit seeker, a fairly high level would be needed to make credit control effective. This would

probably condemn credit policy to the role of a delaying action, hampered in the achievement of sustained effect by the danger of provoking intolerable rate increases. There are reasons for thinking that such high rates will not be necessary. As is well known, it is not only the interest cost of credit that goes up, but also the cost in terms of the conditions surrounding the operation. Maturity, collateral, and purposes for which the funds are to be used (one could regard these factors also as elements of availability) can all be adjusted to make the credit safer and more profitable for the banker and more burdensome for the borrower. Thus a small rise in the rate accompanied by stiffening of other conditions may be the equivalent, in terms of restraint produced, of a larger increase in rate without such stiffening. Bankers are probably quicker to stiffen their non-interest terms than to increase rates, since the former are less obvious. What looks like perfect rationing, therefore, so long as rates have not begun to move up, may be so only in part.

How much of a rate change is likely to follow may further depend upon the extent to which a restraining action by the central bank is taken as a warning of a change in the economic weather, or at least of a change in economic policy. If, as now seems to be increasingly the case, a rise in the discount rate is interpreted as a major change, bankers will tend to reappraise their risks. This may lead to a reduction in the number of customers to whom the prime rate is accorded. In turn, this may produce a curtailment in the volume of credit if, as is reported, some borrowers would rather pay off than accept conditions detrimental to their credit standing or self-esteem. Bankers indicate that borrowers sometimes are more sensitive to differential treatment than to stiffer terms applied across the board.

At the other end of the risk scale, some marginal borrowers may be squeezed out altogether. When risk passes a certain point, it can no longer be compensated by a higher risk premium. (The attitude of examiners—if not the banker's natural dislike for bad situations—tends to make sure of that.) These marginal loans cease to be bankable under the new conditions. The new results of such reappraisals may be a reduction in the volume of "sound" loans that the banker can make, more or less commensurate with the restraint imposed by monetary policy action.

*Banker Replies to Patman Questionnaire.* The answers of bankers to the Patman questionnaire illustrate various aspects of what has been said so far. Most banks seem to have an inner circle of customers who are very likely to be accommodated under all conditions. Borrowers outside this circle are exposed increasingly to rejection when funds become scarce. During the post-Korea period, more-



over, there seems to have been substantial discrimination among borrowers based upon the defense supporting or inflationary characteristics, respectively, of loan applications. In good part this seems to have been due to the Voluntary Credit Restraint program. The Patman answers and other information indicate, however, that discrimination between different types of business is quite usual, although not, of course, by post-Korea criteria.

The Patman answers suggest several things. For once, they point up the importance, to the banker, of screening and reclassification. It is not agreeable for the banker to feel that he is leaving legitimate credit needs unfilled. There is a tendency, therefore, when credit becomes scarce, to screen out some of the applicants on the basis of more rigorous standards and to regard them as no longer creditworthy. In that way, what is really a limitation of the supply of credit is made to appear as a limitation of demand—and the bank is still meeting all legitimate needs. A corollary of this reinterpretation by the banker is that he has less incentive to raise rates than if he viewed the situation in terms of unsatisfied excess demand.

The differential treatment of borrowers further suggests that the incidence of credit control may be quite uneven. Many borrowers may be little affected, while a few marginal borrowers may be completely squeezed out. This raises some questions regarding attempts to measure the effectiveness of credit control by investigating the sensitivity of broad groups of businessmen to interest rate changes. A better testimony may be contained in many unsolicited complaints of businessmen about the difficulty of obtaining credit.

There is another implication, which derives from the "inner circle" status of certain borrowers. In some cases, part of the value that the customer has for the banker is due to his character as an old, established borrower. This value the customer cannot have for any other banker to whom he might switch. Hence, if the banker makes loans to this customer no cheaper than he could get from competing banks, the banker is really obtaining a kind of rent. This may—it need not—induce the banker to move more slowly in raising his terms when credit is being tightened.

*Progressive Rate Increases During a Boom.* Let us return now to our original question: how high must interest rates go to choke off demand if after an initial period of tighter rationing the market returns to its normal degree of imperfection? We have taken note of a variety of factors that co-operate in choking off demand. Their entry into effect reduces the increase in rates that would otherwise be necessary. One may, if one wishes, subsume these factors under the general heading "cost of credit." But one cannot then turn about and identify

interest rates with the cost of credit and argue that small rate changes cannot significantly affect borrowing.

We may now try to fit the mechanics of credit tightening into the setting of an expansionary economy, with a view to observing the influence on interest rates. During an ordinary cyclical upswing, the phase of active credit control is likely to be short—of the order of one or two years. To maintain a constant or growing tightness of money and credit, the monetary authorities will have to take successive steps during this period. Each of these actions—tightening the reserve positions of banks or increasing the discount rate—will have an impact effect and a more enduring residual effect. Each time as the impact effect wears off a further step becomes necessary to maintain a constant degree of tightness. Each such step gives a new impulse to rates to move upwards, with a greater or lesser lag, depending upon the sector of the market. But this kind of pressure is not likely to be continuous. Even during a vigorous cyclical upswing there are likely to be moments of low pressure that give monetary policy a breathing spell. The lag in the adjustment of customer rates provides further respites. Institutional factors and factors that have become familiar in connection with liquidity preference reasoning contribute to holding back the rise in rates. Even though the “equilibrium rate,” which would finally halt the expansion, may be quite high, it may never be reached in this slow progression of upward steps. The boom is likely to come to its natural end before rates have worked up to that level. Monetary policy will thus have been bailed out from having to face the ultimate rate consequences of prolonged monetary tightness.

In a defense-sustained boom, one cannot count on this bailing out. The duration of the boom, as well as its intensity, depends upon the military program. If expansionary forces should be strong and enduring, successive monetary policy measures required to maintain a given degree of tightness may eventually push rates up to a high level. This level will not be as high as that which would have to prevail if the interest cost alone were restraining borrowers. We have noted above the other cost elements in the situation. But the rate might still be above what would be readily acceptable in our existing environment.

The present defense program, however, has not since the Accord produced a boom of sufficient intensity to require a continuously tight policy. Monetary policy has been fortunate, as I said at the beginning, to be able to operate in a fairly well-balanced environment. This seems to indicate that boom conditions rather unlikely in peacetime would have to prevail before monetary policy would run the risk of producing unacceptably high interest rates.

## RECENT DEVELOPMENTS IN CANADIAN MONETARY POLICY

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I sometimes toy with the vision of the Canadian dollar in the post-war period in the role of Eliza crossing the ice, with little Fixed Exchange Rate clasped to her bosom and the twin bloodhounds, Dollar Deficit and Inconvertible Sterling, pursuing her at varying distances. She has made much faster progress since she threw away the baby. But in spite of the compliments which have been coming from the shore, the pleasant island upon which she has been gathering strength during a good part of the last year is almost indubitably built upon an ice floe. And the hounds are still running.

The developments in monetary policy in Canada during the postwar period which have attracted the most attention abroad have been the adoption of the floating dollar policy at the end of September, 1950, and the return to convertibility in mid-December, 1951. In the first instance, the "tidal wave" of speculative capital inflow from the United States created special difficulties for the government at a time when it otherwise faced rising defense expenditures and other domestic inflationary forces connected with the outbreak of the Korean war. In providing the Canadian dollars to finance the capital inflow, the federal government exhausted its own cash resources together with 200 million dollars borrowed from the chartered banks on the security of deposit certificates, and was forced to turn to the Bank of Canada for assistance. Between July 30 and October 18, 1950, the Bank purchased net foreign exchange assets to the equivalent of 393 million dollars in Canadian dollars. As a consequence, to control the inflationary effects of this action, the Bank entered the bond market for the first large-scale restrictive open market operation in its history. That is, over the same period, the Bank sold 337 million dollars of securities as an offsetting operation. It was to put an end to the "extraordinary rate of involuntary borrowing from the United States" (Department of Finance press release, September 30, 1950) that the government on September 30 announced the adoption of the floating dollar policy.

The return to convertibility must be seen against the events which followed the adoption of this policy. We cannot enter here into an analysis of the general program of consumer credit regulation, increased taxation, deferred depreciation, the negotiation of the credit

ceiling agreement with the chartered banks, and other methods through which the government endeavored to master generally inflationary conditions after the outbreak of the Korean war. It must be remarked, however, that the program was adopted against an almost universal public clamor for the restoration of controls of the type administered through the Wartime Prices and Trade Board during World War II. But in its resistance to that clamor, during 1951 and probably before, the government had been working toward a general philosophy which was expressed when the Minister of Finance made the announcement in the House of Commons on December 14, 1951, that all restrictions on foreign exchange transactions were being abolished and that the Canadian dollar was being made completely convertible. The Minister at that time said: "The conclusion I have come to is that we would be better advised not to rely on exchange restrictions, but rather on the general handling of our domestic economic situation to keep us in reasonable balance with the outside world and to maintain the Canadian dollar over the years at an appropriate relationship with foreign currencies."<sup>1</sup>

This is the principle which has informed Canadian policy since that time and it is the principle which the Prime Minister and his colleagues took to the recent Conference of Commonwealth Prime Ministers in London with the hope of using it to combat rising restrictionism in certain sections of the sterling area.

The spectacular strength of the Canadian dollar during the period since it became convertible has drawn more attention to the Canadian economy from the American side of the border than it has enjoyed in many a year. But some of it seems quite uncritical. There are more elements in the strength of the Canadian dollar than the internal strength of the economy and the wisdom of domestic policies. Improvements in the terms of trade and the urgency of foreign demands for certain Canadian products (wheat, base metals, and certain wood products) have provided Canada during 1952 with enough convertible currency to meet the continuing deficit on her American account in spite of the probability that there will be no net inflow of American capital for the year.<sup>2</sup> Use of the Exchange Fund has been limited, by and large, to evening-off operations—the declared present principle for its use. Meanwhile the government has acquiesced in the sub-

<sup>1</sup> *House of Commons Debates* (Canada, 1951), pp. 1,957-1,958. See also Bank of Canada press release, "Some Aspects of International Trade" (address by Mr. Graham Towers, Governor of the Bank of Canada, to the Investment Dealers' Association of Canada annual meeting, St. Andrews-by-the-Sea, New Brunswick, June 13, 1952).

<sup>2</sup> The September-October, 1952, number of the *Monthly Review* of the Bank of Nova Scotia gives an excellent short account of the factors affecting the strength of the Canadian dollar in 1952.

stantial fall of bond prices accompanying the heavy liquidation of Canadian bonds for profit-taking by American owners and some transfer of Canadian accounts into American dollars. Yields for the theoretical bonds published in the *Statistical Summaries* of the Bank of Canada are the highest in the history of these series as published by the Bank and the rise in the shorter rates in particular has been spectacular in relation to their history since 1932.

This shift in the bond support policy seems to me to be so important that I propose in this paper to go back over the earlier postwar period to look at some of the shifts in policy to try to see what they mean. Since time is limited, I propose to confine myself to the domestic aspects of policy.

It is a first necessity in understanding monetary affairs in Canada to know that there is only one policy. The Bank of Canada, by the nature of Canadian institutions, is, what the Deputy Minister of Finance once called it, "the channel through which the monetary policy of the government is put into effect."<sup>3</sup> Though the Governor of the Bank, especially if he have the qualifications of the present Governor, is likely to rank next only to the Deputy Minister of Finance as an adviser to the Minister, decisions of the Cabinet, normally in monetary policy to be taken on the advice of the Minister of Finance, are the final decisions. If Parliament does not accept them, the government falls. Within this one policy, which is the government's policy, various measures may of course be used to reconcile political, fiscal, and monetary ends and to fit the policy of the Department of Finance as consistently into the total pattern of policy as institutions and available information may permit.

The high degree of centralization in the Canadian commercial banking system and the close liaison between the Bank of Canada and the chartered banks must also be considered in any evaluation of policies. For more than a quarter of a century, four banks have controlled some 75 per cent or better of the country's banking assets. Periodic consultations between the general managers of the ten banks and the Governor and his advisers form the normal channel through which negotiations between the monetary authorities and the banks are carried on. The power of the Bank of Canada in the postwar period in working out "agreements" designed to supplement or replace actions of the central bank and in getting its "suggestions" accepted lies undoubtedly in the relation the Bank of Canada bears to the government and in the general preference of the chartered banks for flexible arrangements

<sup>3</sup> *Proceedings of the Standing Committee on Banking and Commerce* (Canada, House of Commons, 1944), Vol. 1, p. 12.



rather than legislation. But I am not at all convinced that "persuasion" has always been a one-way street.

The direct and personal character of the connection between the central and chartered banks has perhaps been rather increased than diminished by the poverty of control measures; that is, by the facts that the main control other than through "persuasion" has been exercised through the securities market, that the chartered banks have never used the rediscounting privilege, that advances to the chartered banks have been very limited and for special purposes, and that the Treasury bill market, if it can be called such, is virtually limited to the central and chartered banks.

If we look at the management of the Bank of Canada over its history, it is evident that the philosophy of management has been consistently expansionist, whether the directing motive at one time or another may have been monetary, fiscal, or political. In only one year shown in the annual reports of the Bank (namely 1947) do the records show a decline in chartered bank reserves and the Governor has explained (*Annual Report, 1947*, pages 23-24) that the correlative decline in security holdings of the central bank was a consequence of government redemptions at a time when the Bank was otherwise an active purchaser of short- and medium-term bonds. The total series of reports shows a reserve expansion of nearly 670 million dollars, and the astonishing thing is that 31 per cent, or 208 millions, of this expansion took place since 1945; that is, after the extraordinary expansions of the war. Perhaps still more surprising is the fact that two-thirds of the postwar expansion took place in the years 1950 and 1951, when the Bank was supposed to be following a "definitely restrictive approach to the whole question of credit restriction" (Bank of Canada press release, February 22, 1951).

It is the persistence of expansionary policy into a period where more orthodox theory would call for contraction which requires examination, both in Canada and other places.

The key to the position of the central bank lies almost certainly in the hegemony of political and fiscal aims over monetary aims, though it is possible that it lies also to a degree in alterations in central banking theory as such. Before the war, and even through the early war years, 1939 through 1942, when the physical volume of output was expanding rapidly, these aims were not in conflict. The policies which would fulfill one aim would fulfill the others. The philosophy of the government itself grew more explicitly Keynesian in the later thirties, and deficit financing and currency and deposit expansion both found consistent places within the total pattern. Moreover, even in the early



war years currency and deposit expansions were relatively modest. Bank of Canada figures show the expansion of currency and bank deposits in the hands of Canadian residents<sup>1</sup> at the end of 1942 as only 51 per cent greater than the year-end figures for 1938; the *National Accounts* show a 70 per cent expansion in the constant dollar gross national expenditure over the same period. The postwar situation is markedly different. Bank of Canada figures show year-end currency and bank deposit holdings of residents nearly 50 per cent higher for 1951 than for 1945. But the constant dollar gross national expenditure for 1951 is shown in the *National Accounts* as only 15 per cent above that of 1945.

To the economist, therefore, it would appear that the harmony of aims which distinguished the prewar and early war periods has been disrupted. The disquieting thing is that certain elements of the philosophy of the depression appear to have been transferred into the postwar situation and that certain statements of the Bank's senior officials imply that a harmony of ends exists among monetary, fiscal, and political policies under circumstances where it would seem that it cannot exist.

There are two types of statements by senior officials of the Bank to which I wish to make reference here: The first holds that in the face of rising external prices, particularly American, or in the face of a rise in the constant dollar value of the gross national product, some (unspecified) expansion of bank reserves, currency, and deposits is justified even under the conditions that have characterized the postwar period—that these have been, in the words of the Bank of Canada press release for February 22, 1951, "a necessary feature of post-war reconstruction and peacetime economic progress." But this policy seems to have ignored the effects of the wartime expansions of currency and deposits and the possibilities of utilizing these in the postwar period. Some discussion of these possibilities will be introduced into this paper at a later place. It seems, however, desirable to introduce at this point a statement that negotiated arrangements with the chartered banks, changes in consumer credit regulations and in taxation are subject to certain limitations as substitutes for a direct regulation of bank reserves and reserve ratios through central bank action. These substitute arrangements tend to be made only after a trend has been well established and when it may be difficult to arrest. More-

<sup>1</sup> The Bank of Canada now publishes in its tables showing "General Public Holdings of Certain Liquid Assets," quarterly estimates of resident and nonresident holdings of currency and bank deposits. See *Statistical Summary, Bank of Canada*, August, 1952, p. 125. This series has recently been further expanded to show approximate divisions for year-ends between corporate and noncorporate holdings for Canadian residents. See *ibid.*, September, 1952, pp. 145-156.

over, political pressures may dictate the removal of these substitute arrangements at a relatively early date.

The second aspect of the Bank's philosophy concerns the reserve ratios of the chartered banks. The Governor expressed his views on this question rather fully to the House of Commons Standing Committee on Banking and Commerce in 1944.<sup>5</sup> He said on that occasion what while the Bank would probably express concern if reserve ratios of the chartered banks fell below 10 per cent, on the other hand if the banks should decide that they should be 11, 12, or even 15 per cent, "we would of course not have the slightest objection, we would simply adjust our policy to conform to that; that is, by buying more securities."

The dangers that reside in this policy are there because the policy may not be a reversible one. The Bank of Canada may not under the appropriate conditions be able to move in as quickly to sell securities as it is free to buy them. Such complaisance toward rising reserve ratios may therefore be an assistance toward inflation in a situation in which the government of the day may have an interest in the support of bond prices, or where a full employment policy may be inducing a certain timidity for political or other reasons in the application of restrictive policies. In December, 1945, the average reserve ratio of the chartered banks for the month was 11.5 per cent and for December, 1949, it was 9.9 per cent. The absolute level of reserves for the former month was 676 million dollars and for the latter, after some ups and downs over the period, it was 729 millions, or only 7.8 per cent higher. But Canadian deposits rose from 5,854 million dollars to 7,344 millions over the same interval—a rise of more than 25 per cent. The bulk of the inflation of postwar bank deposits from 1945 through 1949 was therefore based upon the postwar readjustment of reserve ratios.

The economist must search for reasons behind these attitudes on the part of the Bank. One possible one is that this comparatively neutral attitude toward expansion is the outcome of the absence in the Canadian system of those more easily controlled and self-liquidating methods of raising bank reserves and reserve ratios which have characterized other systems and of a too exclusive dependence upon the securities markets. Another is that the attitude toward expansion may arise fundamentally from a commercial rather than a central banking theory and that it arises because of the closeness of association between the chartered banks and the central bank—and just possibly in part because the Governor himself came to the central bank from a high position in one of the most powerful of the chartered banks and

<sup>5</sup> *Proceedings of the Standing Committee on Banking and Commerce* (Canada, House of Commons, 1944), Vol. 1, p. 720.

holds honestly to a theory of this type. But whatever the validity of either or both of these reasons, the hegemony of the Department of Finance is most certainly an element in the postwar expansion of currency and deposits.

A rather extensive analysis could be introduced at this point based upon statements of the Minister and operations of the Department. But the most complete expression of Departmental philosophy with which I am familiar is contained in the budget speech of May 18, 1948 (delivered by the Hon. D. C. Abbott, Minister of Finance, in the House of Commons, May, 1948). There are three elements in this speech to which attention may be called.

The first is the idea that the reduction of security holdings by the banking system which took place on a large scale during 1946 and 1947 through redemptions by the Department of Finance was a contribution by the government toward control of the supply of money—a factor “offsetting” the expansion of commercial loans. Yet the increase in bank holdings had been carefully paralleled by an expansion of bank reserves and it would be quite in order to say that the decrease released bank reserves for credit expansion that might not otherwise have taken place. It is only if we hold the central bank’s reserve policy to be such that these expansions of commercial credit would have taken place anyway that we can accept the Minister’s statement. But in itself it is illuminating respecting the attitude of the Department toward reserve expansion.

A second idea that comes out of this budget speech—and which has been met everywhere these last six years—is that the budgetary surpluses of these years have been a stabilizing influence upon the economy—a method of fighting inflation. But the validity of this view must be estimated in connection with the nature of the Canadian tax system. In recent years, approximately one-third of the budgetary revenues have come from excise and sales taxation. But these taxes are paid at the manufacturer’s level, typically “on sale or importation” before they can be recovered from final income. When external (or internal) prices rise, or the physical volume of output increases, these revenues rise. In the postwar years, the statistical picture has been complicated by changes in tax rates and in exemptions, but the long upward roll of prices over the period must have supported government revenues against falling rates and increased the effects of rising ones. It is a matter of importance to note that the even more spectacular rise of commercial bank credits over most of the period supports a hypothesis that bank borrowing may have been a significant source of excise tax payments. With corporation and personal income taxes paid predominantly at the source and general sales and excise taxation

bringing funds into the Treasury before they are recoverable through final prices, the effects on income formation will depend upon the general pattern of budgetary and nonbudgetary expenditures and the handling of the cash balances. If, in the face of budgetary surpluses, these latter are held steady or decline (and the evidence available suggests that this has been substantially true since the fiscal year 1946-47), rising revenues from excise and general sales taxation may be passed over to the public through redemptions of bonds, operations of the Securities Investment Account, joint loans to Central Housing and Mortgage Corporation, and in various other ways. The government's philosophy respecting the effects of the surpluses of the past six years seems to have been based upon the production of new savings offsets to new investment. But to the degree that the surplus itself may be based upon a current expansion of bank credits, the savings offsets would not seem to be there. The dynamic aspects of such a situation in a period of inflation would seem to warrant more examination than they appear to have had.

Nothing that is said in this paper is to be interpreted as a criticism of the fiscal soundness of reducing the public debt, as it has been reduced in Canada over the postwar years by over 2 billion dollars or approximately one-eighth of the total. But in addition to the possibilities discussed above, it seems extremely likely that, in the main, funds have been transferred through the tax system from those who regard them as income to those who regard them as producers' or consumers' capital. In a period which favors the diversion of such funds into investment and the purchase of consumers' durables, it seems equally likely that the disposition of these funds by former bondholders will have involved auxiliary calls upon the banking system for commercial credits for working capital and for the financing of purchases of consumers' durables for which down payments have been provided from redemptions. Co-ordination of central banking policy with fiscal policy may have a special importance when accruing surpluses provide the opportunity for reduction of the public debt.

Another aspect of a large-scale redemption program relates to the elasticity of supplies in those markets to which the funds are deflected by the nature of fiscal policy; but this is better discussed perhaps in relation to the third aspect of government philosophy. This concerns the theoretical bases for the low-interest rate policies that by and large kept government bond yields steady, or limited them to carefully controlled movements, until a fairly recent period. In the earliest postwar years the basis for the low-interest policy was very explicitly the fear that postwar inflation would be only a short-lived phenomenon and that the principal problems would still be investment

and employment.<sup>6</sup> But more fundamental and longer lasting in their effects have been the basic concepts of the weakness of "the" interest rate as a brake upon business expenditures or as an inducement to consumers to spend less and save more.<sup>7</sup> The changes in bond prices which would be necessary to the use of such controls have been held to be "drastic" and the conditions likely to be produced by them to be "chaotic." There has been some alteration of the government's attitude since 1950 but one searches in vain for an explicit theory that runs in terms of central bank action and bond yields rather than in terms of "interest rates."<sup>8</sup>

Yet it seems to me that these are not at all the effects we look for from flexible bond prices and yields. The effects are rather the regulation of the quantity of currency, commercial bank reserves and bank deposits. Further we look for assistance in the production and preservation of such an asset structure of rates as will regulate the flow of funds into investment markets under the operation of the principle of opportunity cost. Floor prices for bonds at artificially low yields are not only likely to encourage the "monetization" of such bonds but also likely to accelerate the flow of funds into various investment markets at rates inappropriate to the elasticities of supplies of specialized labor and materials therein, with consequences for the structure of prices. Large-scale redemptions of government bonds without carefully correlated central bank action may exaggerate these effects.

If high costs in particular markets have an issue in prices of output which the general level of incomes in the community does not warrant (and that happened in the housing market in Canada in 1951), sectional reactions may occur. If full employment or other policies underwrite these high costs—and monetary policies are generally expansionary—general inflation reaching from sector to sector of the price structure can destroy the foundations of confidence on which both monetary and fiscal policy must rest. It is on the basis of such reasoning that I look with special satisfaction at the change in the policy toward government bond yields which has evolved in the period since the Canadian dollar became convertible. But there is nothing to show as yet that they are based upon a better articulated theory respecting the relation of bond yields and central bank action to the general economic situation.

The theory behind postwar operations of the Department and the

<sup>6</sup> See Bank of Canada, *Annual Reports*, 1943, pp. 5-6; 1945, pp. 9-11.

<sup>7</sup> See *Budget Speech*, 1948; also Department of Finance press release, "Prices and Credit" (address by the Hon. D. C. Abbott to the semiannual meeting of the Academy of Political Science, New York, April 1, 1948).

<sup>8</sup> See Department of Finance press release, "Savings and Inflation, the Problem and its Setting" (address by the Hon. D. C. Abbott to the Conference on Savings, Inflation and Economic Progress, University of Minnesota, Minneapolis, May 15, 1952).



Bank seems to have been too static, too much related to ideas respecting the development of savings offsets to over-all levels of investment. But statistical evidence can show that there has been going on over the period the underlying and more dynamic process which monetary theory of the cash-balance type would lead us to expect. While public holdings of currency and bank deposits have been growing in absolute terms over the postwar period, the movements of prices and the volume of output have been such that they have been falling in relation to the growth of the gross national expenditure since they reached their maximum in 1946. That is, as real balances, they have been falling toward something that looks somewhat like a "normal" relationship. The following table is part of a larger one indicating the nature of these patterns over the period for which data are available:

YEAR	I RATIO OF CURRENCY AND ACTIVE BANK DEPOSITS TO CANADIAN GNE	II RATIO OF INACTIVE DEPOSITS TO CANADIAN GNE	III TOTAL OF I AND II
	%	%	%
1938	19.9	25.8	45.7
1942	21.4	12.8	34.2
1945	28.4	19.0	47.4
1946	31.2	22.5	53.7
1949	25.3	22.0	47.3
1951	21.7	17.7	39.4

Note: Year-end figures for currency and deposits from *Statistical Summaries* of the Bank of Canada have been divided by the appropriate figures for the GNE from the *National Accounts*. Again tables refer to holdings by Canadian residents only.

During 1952, economic relationships in Canada have been relatively stable. Perhaps we should add the more nearly normal real balances to the convertibility of the Canadian dollar, the strength of the reserve position, the improvement in the terms of trade, the improved supplies of convertible nondollar currencies, variable bond yields and flexible exchange rates when we endeavor to explain the strength of the Canadian economy, the correlative strength of the Canadian dollar on the foreign exchange market, and the comparative stability of prices in 1952.

Immediate prospects for the continuance of stability look promising, but there may be special threats to sound policy a little further ahead. From the standpoint of domestic policy, these may arise because next spring's budget will be an election budget (with all the temptations that implies) and because not very long after the next election the government of the day will face a long period of refunding. Beginning with March 1, 1954, and stretching to September, 1966, there will be a period when the refunding or redemption of all the great public

long-term issues of the war must be negotiated. Under such conditions, fiscal motives for the return to artificially low yields on government bonds will be strong.

It is the central position of this paper that policy would have been more rational if increases in bank reserves and bank deposits in response to rising external prices or increases in output had been deferred until the wartime inflation had worked itself out. This is another way of saying that monetary aims should have been given a higher place and monetary policies more generally resorted to at an earlier date. Anyone who wishes to isolate the principal responsibility for the policies that were actually adopted should look to the bond market operations of the Department of Finance in 1947, when the Bank of Canada's open market purchases were apparently confined to the medium- and short-term security market, and yet the prices of long-term bonds rose to their highest levels.

If I have toyed with the vision of the Canadian dollar in the role of Eliza crossing the ice, I have also toyed with the vision of the Bank of Canada in the role of the honored Victorian wife, revered alike for her ability to carry out the behests of her spouse, the Department of Finance, her capacity to produce comparative serenity in the midst of great familial urgencies, and for her sagacity in the advice she gives her lord—advice which he is free to accept or to ignore. I should like to make a modern woman of her, but there are limitations on the possibilities in that direction. The Douglas and Patman subcommittees of the Joint Committee on the Economic Report to Congress have made certain suggestions for the enhancement of the position of the Federal Reserve System in relation to the United States Treasury. But in Canada the high degree of concentration in the commercial banking system, the political temper of the Canadian people, and the nature of the Canadian constitution make impossible, if not intolerable, the adoption of suggestions of the same type with respect to the position of the Bank of Canada.

Reverence is, however, hardly the most healthful atmosphere within which a great public institution may discharge its functions. It is possible, though perhaps paradoxical, that the atmosphere of continuous and objective criticism proper to such institutions in a democracy might free the Bank of Canada to some degree from political pressures and permit its officers to develop a theory of central banking adequate to the urgencies which may confront free societies for generations. There are only two real sources for this criticism: the academic community and Parliament. But it is the misfortune of the Canadian academic community that most of those most competent to offer criticism have either disappeared permanently into the anonymity of

the upper hierarchy of the civil service or have been so long associated with the government at the policy level during the war and early post-war periods that their freedom of expression must be impaired.

As for Parliament, Professor Alexander Brady has made it clear<sup>a</sup> that within the British Dominions threats to democracy come not from ideologies but from apathy and, in particular, from the failure of Parliaments to develop those institutions and attitudes which in the British House of Commons have made criticism so continuous, objective and largely nonpartisan, and so very frequently effective. Certainly at the present time opposition parties in the Canadian Parliament are contributing nothing fundamental to the solution of the problems I have posed here. While we cannot hope after the next election to find a David Ricardo in Parliament, it would be a fine thing if we could find another Senator Douglas there! Perhaps it is the only hope we can have for a permanent return to common sense.

<sup>a</sup> *Democracy in the Dominions* (2nd ed.; University of Toronto Press, 1952), Ch. 23.

## DISCUSSION

**LLOYD W. MINTS:** Mr. Johnson has outlined very well for us the postwar monetary measures that have been taken by the British Government, particularly since the advent of the Conservative Government in the autumn of 1951. The unpegging of the Treasury bill rate and the raising of Bank rate are clearly in accord with time-established procedures. I have some misgivings, however, as to the extent of the rise in the market rate on Treasury bills that the government would permit without reintroducing support for the market by the Bank of England; just as I also have some doubts whether the Federal Reserve System and the American Treasury would permit government bond prices to fall much further without taking action. I have no explicit grounds for my suspicions, except, perhaps, statements on both sides of the Atlantic to the effect that the authorities still think that an "orderly" market for government obligations should be maintained. An orderly market is a term that is susceptible of a wide range of interpretations by the authorities. Both the British and American Governments should emphatically disavow any intention at any time or under any circumstances of attempting to influence the rates on government securities as an end in itself. To be sure, there will be occasions when governments should be bought or sold by the central banks, but their criterion of action should be something other than the intention of maintaining some particular rate on either government or private securities.

It is Mr. Johnson's belief that the qualitative controls which have been retained and in some instances strengthened since the autumn of 1951 have been more effective in preventing an expansion of bank advances than have the quantitative measures. He may be right about this; but if so, it does not constitute evidence that the quantitative measures could not have been entirely effective if they alone had been relied upon. The continuance at all of the qualitative controls is a source of extreme disappointment to one who believes the market is a superior device for the organization of economic affairs. Particularly is it to be regretted that the Capital Issues Committee was retained.

But there is yet another serious infringement on the market mechanism that unfortunately has been retained by the British. I refer to the pegging of the foreign exchange rates. Unless the pegged rate was by remote chance fixed at the equilibrium level, how could there fail to be a dollar shortage if the rate overvalued the pound? Furthermore, for several years after the close of the war it was inevitable that the equilibrium rate itself would be almost constantly changing, and possibly quite markedly. Even though, therefore, the pegged rate were at the equilibrium level originally, it would shortly fail to be.

I am quite aware of the argument that a change in the rate that would reduce the external value of the pound would worsen Britain's international position if the elasticities of demand of the British for imports and of the demand for British exports were less than one. I can do little more in the very short time at my disposal than to assert my doubts about the validity of this point of view as an argument against freeing the British foreign exchange rate. The British demand for imports may indeed be inelastic; but I can hardly con-

ceive of this being true of the demand for British exports. A large proportion of British exports consists of products which are essentially similar to the exportable products of other countries. This being so, the demand for the British portion of the world output must be elastic, even though the world demand for the products should be inelastic, a condition that has by no means been established.

I am also well aware of the contention that a free exchange rate would have disrupted the domestic economy. I can only say, in regard to this contention, that I can think of no other means of bringing about rapid adjustments in an economy that promises to be as effective as a price system. It is precisely during such conditions as those of the postwar years that a market mechanism shows up to best advantage.

To this assortment of baleful comments I should like to add one more. The government of the United States is in some measure—although possibly only to a minor degree—responsible for the British policy of pegged exchange rates, direct restriction of imports, bilateral agreements, and similar measures. Equality in the foreign payments and receipts of a country can be maintained in any one of three ways: (1) The country can adopt an international monetary standard, granted that other nations take similar action; in which case international flows of currency will have the effects on the domestic price structure required to maintain equilibrium. (2) It can adopt an independent, national, currency system with free foreign exchange rates. In this instance movements of the exchange rates will bring about the appropriate adjustments in the domestic price structure. Or (3) the country can adopt a national standard, peg its exchange rates, and depend upon direct controls of various kinds, such as import quotas, export subsidies, and so on, to balance its foreign accounts.

It seems evident that the American delegates to the Bretton Woods conference were chiefly interested in promoting multilateral trade, a consummation greatly to be desired, and that they believed stability of exchange rates would operate powerfully in this direction. While they by no means completely ignored the necessity of providing for international equilibrium, they nevertheless apparently either underestimated the importance of this problem or overestimated the efficacy of the very awkward means that the International Monetary Agreement provides. The result is that the government of the United States has been an important influence in support of the system of pegged exchange rates, and this system has compelled various nations to resort to direct controls of imports and bilateral agreements of precisely the kinds that the government of the United States was hopeful of avoiding.

In Great Britain, Canada, and the United States the first faint gleam of monetary sanity in recent years has been the elimination of the pegged price on governmental securities. In Canada, however, the adoption of free exchange rates has been an additional hopeful sign. Particularly encouraging is the statement by the Canadian Minister of Finance, quoted by Miss Timlin, to the effect that Canada can best maintain its balance with the outside world by means of its handling of the domestic situation. This is encouraging, that is to say, provided the Minister did not have in mind the "handling of our domestic economic situation" by means of direct controls.



Shortness of time compels me to desist in this praise of governmental monetary officials, particularly since, in truth, my confidence in them is at a very low ebb. Miss Timlin's paper raises a question of great importance: that of the relation between a central bank and the government. This problem has been long debated, and there seems as yet to be no consensus on the subject in prospect. My own position may seem paradoxical, since I would advocate a closer relationship despite my lack of confidence in governmental monetary officials. I see no possibility of avoidance of final governmental responsibility for monetary policy, and consequently it seems to me pointless to suggest that a central bank should be "independent" of the government. This responsibility should be clearly recognized, and the legislature should act accordingly. This action should take the form of indicating by legislation the precise policy to be followed by the monetary agency. The great evil today grows not out of the influence of treasury departments but from the delegation of discretionary monetary power to both treasuries and central banks. Clearly neither of these agencies can be trusted with discretionary power. They turn from one ill-conceived policy to another, typically ignoring the patent requirements of the existing situation.

HERBERT STEIN: I would like to comment on, or rather ask questions about, two points in Mr. Wallich's excellent paper. First, I would like to comment on the idea of neutrality in monetary policy.

Neutrality is a peculiarly undescriptive word as applied to monetary policy. I suspect, from the historical context in which it arose, that its selection or possibly its unconscious appeal was due to its propaganda value. The policy of pegged interest rates was obviously a policy of intervention or interference in the money market. There are a great many people to whom the idea of government intervention, even intervention by the monetary authority in the money market, is repulsive. So it must have seemed attractive and useful to describe the alternative policy as one of nonintervention, of allowing natural forces to work in the market—in short, as a policy of neutrality.

Now I would not be concerned about the use of this particular word if I did not fear that it would come to have—or has already acquired—a specific meaning. This meaning is visible in Mr. Wallich's paper. Under a neutral policy the reserves of the banking system would be kept constant except for seasonal variations and long-term growth. The demands for credit would beat against these reserves with greater or less intensity, automatically tightening the money markets in boom and easing them in recession. There is much to be said for such a policy. It would certainly be better than the kind of policy we have had most of the time in the past. But is it good enough to be the limit of the ambition of monetary policy?

The neutral monetary policy is analogous to the kind of automatic budget policy that a number of people have been suggesting in recent years. In such a budget policy, tax rates and expenditure programs would not be changed in response to economic conditions. This would automatically give rise to increased receipts and reduced expenditures in a boom and vice versa in recession and would exert a stabilizing influence on the economy. For various

reasons, this is probably the most we can ordinarily expect from budget policy. We shall be lucky even to achieve that.

But the question always arises about such a budget policy: is it enough to maintain reasonable stability? One answer given to this question is that it is not necessary for budget policy to be adequate by itself if it is part of a larger policy that is adequate. What this means practically is that we can be content with an automatic budget policy if we have a sufficiently active monetary policy.

If we are going to be reasonably confident of reasonable stability in a world subject to destabilizing forces of unknown size, there should be at least one instrument that we are prepared to use all-out, as much as necessary. It seems to me that monetary policy is well suited to that role, because as contrasted with budget policy it is less governed by other objectives that limit its application. That is why I would be sorry to see monetary policy accept so limited a function as is implied by the term "neutrality."

The second point in Mr. Wallich's paper on which I should like to comment is the relative emphasis to be placed on higher interest rates as compared with other instruments of credit allocation in the process of credit contraction. Mr. Wallich has described convincingly the ways other than higher interest rates by which a bank may parcel out a restricted supply of credit to borrowers. He has also explained why a bank may prefer to use these other methods rather than higher interest rates. But there remains the question: how does the bank decide that it must restrict its extensions of credit to borrowers? Reference is made to shortage of reserves. But I do not think this is the way the matter appears to the individual banker. Before the bond market was unpegged, the individual banker could obtain funds to lend by selling government securities or allowing them to run off. He could do the same thing after the market was unpegged. The difference was that the yield on governments had increased, and he had to give up more in order to switch into loans. The increased yield on government securities is, it seems to me, one of the important factors inducing the bank to restrict its loan extensions—by one means or another—and inducing the insurance company to restrict its extension of mortgages.

Of course, once the Federal Reserve had withdrawn from the market, the attempt of banks, insurance companies, and others to switch from governments into other investments could not add to bank reserves and permit an expansion of bank assets. But it could drive down the prices of governments and raise their yields and might also provide banks with funds from outsiders to lend. Yields rose until lenders were willing to restrict private loans to the extent that they did rather than attempt to obtain more funds by disposing of governments.

The point of mentioning this is to warn against promising too much; that is, to warn against promising that because of imperfections in the market, credit can be tightened without substantial increases of interest rates. With lending institutions holding large supplies of government securities traded in nearly perfect markets, a rise in the yields of those securities is an integral part of the process of credit restraint. And if the restraint needed is large, may not the rise of yields also be large? If so, we should be careful about not getting

too firmly committed to the idea of certain interest rates as intolerable or unacceptable.

G. FINDLAY SHIRRAS: From time to time the economist, like the philosopher, has to take general views and look, as did Adam Smith in his essay on the history of astronomy, for "connecting principles." Mr. Johnson in his excellent paper has drawn attention to the revival of general credit control along with fiscal policy and also selective credit controls. I should like to go further and stress in recent British monetary policy the importance of the balance of payments. It is, as it were, the banking account of the country, determining its command over liquid funds to meet current obligations, and indeed an index of the financial and economic health of the country. English classical doctrine held that direct intervention in balance-of-payment matters was undesirable on the assumption that internal and banking policies and internal budgetary policies created a sound basic relation to the external situation. Easy money and continued inflation under full employment had their inevitable effect on the balance of payments by stimulating the demand for imports and diverting to the home market products—largely engineering products—that should have been exported to pay for imports. The finance of rearmament added to the difficulties of the external position, but at long last the old-fashioned monetary policy came into its own and led to what Mr. Johnson has so clearly described. We have learned that it is not possible to pursue at the same time domestic policies of an inflationary character, external policies that assume a fixed exchange rate of the pound, and commercial policies of liberalizing trade. It has been clear, too, that our domestic problem—inflation under full employment—is not solved by a balanced budget which itself is an inflationary factor because of the high level of public expenditures.

I have always held that Keynes did not give much attention to the international application of his system as developed in his *General Theory of Employment, Interest and Money*, and he did not integrate into the theory of what determines the national income the theory of the balance of payments, although in a posthumous article in the *Economic Journal* (1946), the year of his death, on the balance of payments of the United States he said: "I do not suppose that the classical medicine will work by itself or that we can depend on it. We need quicker and less painful aids of which exchange variation and overall import control are the most important. But in the long run these expedients will work better and we shall need them less, if the classical medicine is at work. And if we reject the medicine from our system altogether, we may first drift on from expedient to expedient and never really get fit again." Fortunately, as Mr. Johnson shows, the medicine is in use and is working well.

To turn to Professor Wallich's paper, I think it will be agreed we have here an admirable exposition of Federal Reserve policy from one who seems to have been in the machine. But I am critical of the selective controls and obligatory reserve requirements as disinflationary forces as long as interest rates are pegged. That I believe is the lesson from American monetary policy from 1946 to 1951. Up to March, 1951, credit expansion was not diverted from its inflationary course because the commercial banks could get all the cash they

required by selling governments to the "Fed" at par. They then with the cash pyramided their loans by four or five times. After that date, however, we have seen that in an advanced industrial country like the United States even a small increase in interest rates can curb inflation because it reduces the banks' willingness to lend as well as putting a break on borrowers.

If we review the four main credit controls—obligatory reserve requirements, voluntary credit restraint, selective credit controls chiefly on installment purchases and housing, and flexible interest rates—the weakest was, as we have shown, the first of these. The commercial banks could expand credit by selling government securities to the "Fed." Selective credit controls such as Regulation W imposing down-payment minima and maturity maxima for consumer credit and Regulation X for real estate credit have had an interesting history before they were scrapped in 1952. When Regulation W was withdrawn in May, 1952, the Voluntary Credit Restraint program also terminated. V.C.R. was a convenience to a banker since, when bond prices fell and bankers were anxious to restrict loans, the customers of the banks could be told that it was not due to the banks that their request for loans was negated but in view of the ruling in Washington.

One thing is clear and that is until the Accord on interest rates between the Federal Reserve and the Treasury was made in March, 1951, credit restraint was not effective. A very small rise in rates as shown by the yield on U. S. Government bonds has been able to bring the credit inflation under control. The flexibility introduced into the government bond market by the abolition of pegged bond prices in March, 1951, resulted only in a small fall in bond prices and this caused banks to curtail their most risky assets: business loans. One lesson is clear from a study of American monetary policy in these years and it is this. Disinflation in the American economy can best be enforced by monetary, not budgetary, policy. It is often said that a larger proportion of spending depends on credit than in any other country of the world.

I have left myself hardly any time to deal with Professor Mabel Timlin's paper. It is a paper which, in the words of the *Book of Common Prayer*, should be "read, marked, learned and inwardly digested." There is, however, one criticism where the author deals with budgetary surpluses as a method of fighting inflation. "But the validity of this view," she writes, "must be estimated in connection with the nature of the Canadian tax system" and holds that general sales and excise taxation can be inflationary. "With corporation and personal income taxes paid predominantly at the source and general sales and excise taxation bringing funds into the Treasury before they are recoverable through final prices, the effects . . . will depend upon the government's handling of its cash balances." If these "are held steady or decline (and the evidence available suggests that this has been substantially true since the fiscal year 1946-47), rising revenues from excise and general sales taxation will be passed over to the public through redemptions of bonds, operations of the Securities Investment Account, joint loans to Central Housing and Mortgage Corporation, and in various other ways. The government's philosophy respecting the effects of the surpluses of the past six years has been based upon the production of savings offsets to new investment. But to the

degree that the surplus itself may be based upon a current expansion of bank credits, the savings offsets would not seem to be there." Miss Timlin is thinking of the actual payment of the tax and is overlooking the constant flow of the proceeds of the taxes and their outflow. I do not believe there is any inflationary effect unless at any time there were considerable changes in the tax rates. Miss Timlin's remarks on the use of the budgetary surpluses as a stabilizing influence on the Canadian economy and the fiscal soundness of reducing debt are certainly to be commended. I should add that Canada in these postwar years does not appear to lack a good short-money market, as is sometimes alleged. The Canadian banks have an outlet for short-term funds in the local bond markets and these have been cultivated with much success by the young and active central bank, the Bank of Canada.



## A STOCK-TAKING OF BRETTON WOODS OBJECTIVES

### TRADE POLICY FOR THE FIFTIES

By CLAIR WILCOX  
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The policies that affect the foreign trade of the United States are bound to be re-examined in the spring of 1953. This is true, first, because these policies have been both costly and less than wholly successful; second, because there will be forces working for alterations in policy at home; and third, because there will be requests for reconsideration from abroad.

The United States has striven, ever since the war, to restore the health of the world's economy. It has contributed to economic reconstruction, over the past seven years, more than 35 billion dollars in loans and grants. It has sought to stimulate the flow of goods and services. Given pronounced imbalance of trade, it has accepted restrictionism and discrimination, when practiced by others, as necessary evils. But it has assumed that a period of transition was shortly to be followed by the re-establishment of normal market relationships. In the meantime, it has worked for convertibility of currencies, for resumption of international investment, and for greater freedom of international trade. In part it has succeeded; in part it has failed. Recovery has been realized but trade has not been freed. Currencies are still inconvertible, investment sluggish, and commerce subjected to restrictive and discriminatory controls. Our aid has eased the world's pains. It has not removed the causes of its malady. More drastic remedies would seem to be required. There is thus need for re-examination of every aspect of our foreign policy: of monetary policy, investment policy, aid policy, and trade policy. Such re-examination is not only desirable; it is inescapable.

A party twenty years out of office now returns to power. The policies it inherits are identified with the opposition: Point Four, for instance, with Truman's inaugural, and the trade agreements program with the name of Cordell Hull. The new administration may well desire to develop policies and programs of its own. It will be pressed both to maintain foreign aid and to reduce it, to put tariffs up and to bring them down. Even if it wished to avoid decisions, it could not do so. The aid laws and the appropriations that support them expire in 1953.

The authority to negotiate new trade agreements expires that year on the 12th of June.

There will be pressure for action at home; there will also be pressure from abroad. The countries of the British Commonwealth and those of Western Europe are almost certain to advance proposals involving substantial changes in the arrangements that now govern trade and payments. And the principal recipients of our loans and grants are likely to be as reluctant to keep on taking as we are to keep on giving. The purpose of our friends abroad is expressed in a telling slogan, adopted first by them: "Trade, not Aid." And this slogan centers the attention of the world, quite rightly, on the tariff policy of the United States.

It is the purpose of this paper (1) to show just where that policy stands today, (2) to point out the direction that it should take in the future, and (3) to ask whether it is likely to go that way. If the discussion is dogmatic and emphatic, this fault may be attributed, in part, at least, to the demand for brevity.

## I

The United States has trade agreements with forty-four other countries, thirty-three of them signatories to the General Agreement on Tariffs and Trade—negotiated at Geneva, Annecy, and Torquay from 1947 to 1951—and eleven of them parties to bilateral agreements that are independent of the GATT. Since 1934, these agreements have reduced the average level of duties on dutiable imports into the United States (measured in weighted average ad valorem equivalents, with specific duties converted to ad valorem figures at 1951 prices, and with all duties weighted by the volume of imports in 1949) from 25.8 per cent to 13.3 per cent. In short, they have cut the rates of the Hawley-Smoot tariff in half. American imports, which dropped from 4.4 billion dollars in 1929 to 1.3 billion in 1932, have run close to 11 billions in 1951 and 1952.

These figures, however, must be qualified. Since high duties cut imports more than low duties, the former are given a lighter and the latter a heavier weight in computing averages. Our tariff is therefore more restrictive than the weighted average ad valorem equivalent reveals. It still contains many rates that are virtually prohibitive, those on coal tar dyes, for instance, running as high as 200 per cent and 300 per cent of the foreign price. These duties are accompanied, moreover, by other measures that hamper and distort the flow of trade: by obstructive methods of customs administration, by the Buy American Act compelling procurement officers to purchase domestic goods unless their prices exceed those charged abroad by more than 25 per cent, by tying provisions in foreign aid laws requiring that goods financed

by loans and grants be bought in the United States and transported in American ships, by heavy subsidization of the merchant marine, and by the maintenance in agriculture of a two-price system whose successful operation necessitates the subsidization of exports and the imposition of quotas on imports. In absolute figures, our imports have risen; relatively, they have declined. In 1929, they were 5 per cent of national income; today, they are only 3 per cent.

Duties have been sharply cut. But the cuts have never been enacted into law. They are embodied in the trade agreements. And these agreements stand on shaky props. The Trade Agreements Act itself expresses a protectionist philosophy. Its purpose, as stated, is to increase our export trade. To this end, we offer "concessions" to other countries (i.e., to let them bring us goods) and ask them to make "concessions" to us (i.e., to take our goods away) and we excuse the concessions we give (i.e., our gain of goods in imports) by advertising those we get (i.e., our loss of goods in exports). And when the trade agreements program is attacked, we argue that no American producer has been harmed by the concessions we have made. This may be true. Since 1934 our national income has steadily increased; imports have grown while domestic output has grown still more. But the argument goes further, suggesting that American goods should never be displaced by foreign goods, whatever the difference in quality and cost. In a situation where we obviously need to narrow the gap between our exports and our imports, it is still contended that the trade agreements program does not increase our imports (which would be desirable) but does increase our exports (which is not).

The protectionist flavor of the Act was strengthened when it was renewed in 1951. The peril point amendment, reinserted in that year, requires the Tariff Commission to fix a level below which a duty cannot be cut without "causing or threatening serious injury to the domestic industry producing like or directly competitive articles. . . ." The President must inform the Congress if a deeper cut is made. Such cuts may or may not be perilous to industry; they will certainly be perilous to the negotiators whom Congress holds responsible. An escape clause, now given statutory effect, provides for the restoration of higher duties or the imposition of quotas whenever a product covered by an agreement is "being imported into the United States in such increased quantities, either actual or relative, as to cause or threaten serious injury to the domestic industry." Under this clause, the American watch industry sought a higher tariff, though its sales had doubled since the Swiss agreement, on the ground that they had not kept pace with those of its Swiss competitors. Section 22 of the Agricultural Adjustment Act has long authorized the imposition of import fees or quotas when any agricultural product is entering the country "in such

quantities as to render or tend to render ineffective or materially interfere with any program or operation" administered by the Department of Agriculture. In 1951, the Congress provided that this section should override the commitments contained in all trade agreements, old as well as new. As a result of these amendments, Americans negotiating future agreements will probably offer less. And they will certainly get less, since it will be clear that anything they offer may shortly be taken away.

Not only are future tariff cuts made difficult; there is danger that rates already reduced will be restored. This might be done through resort to the escape clause or through action under Section 22. So far, escapes have been approved in only three cases: women's fur felt hats and hat bodies, hatter's fur, and dried figs. In seven cases since the law was amended, the Tariff Commission has voted against the applicants, its Republican members usually finding injury while its Democratic members did not. In two others, garlic and watches, a majority recommended higher duties which President Truman declined to proclaim. But many cases are pending. And if a new Commission and a new President prove to be more generous, their numbers will be multiplied. Under Section 22, an import fee has been imposed upon shelled almonds, and the Secretary of Agriculture has recommended that a fee be added to the duty on wool, raising the burden on this product—if set at the figure suggested in the press—from 25½ cents to 42 cents a pound.

Under our trade agreements, such measures entitle other countries to retaliate. And they do so. When we withdrew our concession on hatter's fur, Belgium withdrew her concession on industrial wax. When we restricted imports of figs, Turkey raised her duties on typewriters, washing machines, refrigerators, and many other goods. When Congress took action to curtail imports of fats and oils and dairy products, in the so-called "cheese amendment" to the Defense Production Acts in 1951 and 1952, the Netherlands cut imports of American flour and a number of other nations announced their intention to retaliate. If the tariff on wool is raised, the basis of our agreement with Australia will be destroyed and the whole structure of our agreements with the nations of the British Commonwealth may well be lost.

The GATT may be worn away through erosion; it can be leveled by a single blow. This instrument was to have been administered by the International Trade Organization. In the absence of such a body, the responsibility has been assumed by the Contracting Parties, an annual conference of thirty-four member states. This group has no secretariat of its own, relying for such service on the Interim Commission set up by the United Nations for the never-to-be-existent I.T.O. Commitments to the GATT have been provisional, pending

action on the Havana Charter. Any signatory, on giving notice, can withdraw in sixty days. In England, there is agitation to denounce the GATT and thus to escape from rules that prevent increases in preferences and hamper discrimination in the use of quantitative controls. In the United States, Congress wrote the following words into the Trade Agreements Extension Act of 1951: "The enactment of this Act shall not be construed to determine or indicate the approval or disapproval of the Executive Agreement known as the General Agreement on Tariffs and Trade." The GATT thus lives on sufferance, as welcome as a bastard child.

If the Trade Agreements Act were to expire, no more negotiations could be undertaken, but past agreements would survive until denounced. If the GATT were to be denounced, the American tariff would immediately rise, on the average, by 40 per cent. And if the pre-GATT and non-GATT agreements were also abandoned, the tariff would be doubled, returning to the rates of Hawley-Smoot. This is how we stand today. Where do we go from here?

## II

Our national interest requires not merely prevention of tariff increases but further reductions in barriers to trade. Our exports have outrun our imports since the war at an annual rate of 5 billion dollars, half of this consisting of military items and half of civilian goods. We have financed this surplus by extending foreign aid. Our action was desirable in the emergency. But it cannot be continued as a permanent policy. Such a course would not be fair to the American taxpayer. It would not be acceptable to other nations. It would not afford a sound basis for friendly international relationships. If we are not to keep on lending and giving, our alternatives are two: we can permit our exports to fall back to the level of our imports; we can maintain our exports by allowing our customers to pay for them in goods and services. Either course will necessitate adjustments. Larger imports will compel some of our sheltered industries to adapt themselves to competition, accepting smaller profits, cutting their costs, or even reducing the scale of their activities. But smaller exports would condemn to idleness the more efficient capital and labor that now produce vast quantities of goods each year for sale abroad. The first of these developments would be difficult; the second would be more so.

Removal of barriers to imports is needed for prosperity; it is even more important to national security. High duties and "Buy American" requirements increase the costs of materials needed in production for defense. They speed up exhaustion of scarce domestic supplies. They discourage production abroad to meet our needs. Our policies on aid and trade, moreover, appear to be designed to drive a wedge between



ourselves and our allies. We object when Denmark delivers a tanker to Russia, but we exclude Danish cheese from the United States. We do not wish Japan to sell in China, but we move to raise a tariff when she tries to sell tuna fish to us. So Moscow shrewdly holds out the hope of markets behind the Iron Curtain, and Stalin confidently predicts the wreck of Free World unity upon the rock of trade. And he may well be right. If we close our doors to our friends, we shall drive them into the arms of our enemies.

It follows that tariffs should be cut, but how? A mere renewal of the Trade Agreements Act will not suffice. The law has been enfeebled by amendments; it is no longer an effective instrument. Renewal would preserve a symbol; it would not permit the action that the times require. Determination of duties, however, should not be returned to Congress. For action there would be delayed and the law that finally emerged rather than bringing tariffs down would doubtless put them up. A new approach—and a bold one—is required.

Instead of being isolated and exposed to attack, trade policy should be handled in the context of foreign economic policy as a whole. Proposals with respect to currencies, investments, aid, and trade should be presented as related parts of a common program, considered in the same hearings, covered in the same debates, enacted at the same time, included in the same appropriation, and administered by the same agency. Thus handled, trade policy would gain in clarity of purpose and would take on borrowed strength.

The rationale of the policy should be that of increasing imports, not exports. Its stated objectives should be to preserve prosperity by preventing the loss of long-established export markets, to cut the budget and the burden of taxes by reducing the need for foreign aid, and to safeguard the nation's security by facilitating the procurement of strategic materials and by promoting the strength and the solidarity of the Free World. The approach should be that of "Trade, not Aid."

In this context, barriers to commerce should be attacked, promptly and simultaneously, along a number of different lines. First of all, the disclaimer of the GATT should be repealed and funds appropriated to support its secretariat. Either this, or the rates of duty embodied in the trade agreements should be enacted into law, replacing those of the Hawley-Smoot tariff, now more than twenty years out of date. Some such action is needed to guard against the disaster of sudden and substantial increases in tariff rates. Second, nontariff obstructions to trade should be removed. The customs simplification bill, embodying provisions negotiated at Geneva and Havana, generally approved by American business and pending in Congress since 1949, should finally be passed. The Buy American Act, a relic of the Great Depression,

should be repealed. The tying provisions should be removed from the laws that authorize loans and grants; recipients of dollars should be allowed to spend them where they will; funds supplied for foreign aid should not be diverted to domestic industries. Logically, also, subsidies should be withdrawn from American shipping and some method other than parity price supports adopted for aiding agriculture, so that export subsidies and import quotas would no longer be required. But these two measures do not fall within the bounds of political possibility. The other proposals, however, are both desirable and feasible.

Nor should action stop here. Exorbitant duties should be cut immediately by establishing a ceiling on protection at, say, 50 per cent ad valorem and reducing all higher rates to this amount. Provision should also be made for future cuts. This should be done in three ways. First, a steady approach toward freedom of trade should be assured by adopting a formula under which duties would be reduced, for example, by 10 per cent at the end of each year for the next ten years. This would proclaim to the world the future direction of American policy. And it would enable domestic industry gradually to adapt itself to the change. Second, the President should be empowered to issue orders, upon recommendation by the competent military authorities, suspending or removing all barriers to the importation of materials found to be essential to the defense of the United States. Domestic industries producing for military use if unable to meet foreign competition should be subsidized. And finally, the principle of delegating to an executive agency the power to negotiate trade agreements with other nations should be preserved. But this authority should not be limited in duration. And negotiators should not be forbidden, as is now the case, to transfer items from the dutiable list to the free list or to cut existing duties by more than half. Completed agreements, however, should be submitted to Congress, to be accepted or rejected in their entirety, taking effect unless defeated by a majority vote in both houses within sixty days. The periodic struggle over renewal of the power to negotiate would thus be avoided, the negotiators given greater latitude, and the constitutional authority of Congress maintained.

The law must also face the problem of the industry that is seriously injured by an increase in imports resulting from a reduction in a tariff rate. Here, the criteria for action should be stiffened, and remedies other than restoration of a higher duty should be tried. Injury should be held to exist only when the domestic industry suffers a sudden and substantial reduction in the absolute volume of its sales. And it should be regarded as serious only when this development destroys profits, not for a few marginal firms, but for the industry as a whole. Remedial action should be taken only in those cases where alternative employ-

ments for the resources in question are not readily at hand. And this action should preferably take the form of extended unemployment compensation and retraining benefits for labor and of technical assistance, loans, and grants for the conversion of industry. Reductions in duties should not be suspended unless it can be shown that other remedies are not available. And here, effectiveness of the lower rates should merely be postponed. The President should be authorized to raise tariffs, but only as a means of retaliating against nations that deliberately discriminate against the trade of the United States.

These proposals contemplate a sharp reversal of existing policy. They emphasize legislative rather than executive action, and reliance on unilateral rather than multilateral instruments. With nontariff barriers removed, exorbitant duties cut, duties on essential military goods abolished, and further reductions assured by law, negotiators of future trade agreements would be left with weakened bargaining power. With past reductions given statutory effect, other parties to existing agreements would be relieved of such restraint as is imposed upon them by the fear that, by tightening their restrictions, they would forfeit concessions granted them by the United States. For many years, this country has sought to influence commercial policies throughout the world by building a structure of precise commitments having the effect of law. Since 1947, it has worked through an international medium—the Contracting Parties of the GATT—where these policies are debated and these commitments interpreted and enforced. Now, it would put its reliance less in agreement and organization and more in the force of the example it would set.

This shift in emphasis would involve some loss. Continuing consultation, through meetings of the Contracting Parties, has contributed to international understanding and to the peaceful settlement of differences. If the GATT survives, these meetings could be continued. If not, some of their advantages could be retained by authorizing the government to join with other nations in setting up an international trade organization with purely consultative and recommendatory powers.

Instead of acting unilaterally, some of the critics of the trade agreements program would have us adhere to our present course, but bargain more skillfully, obtaining more binding commitments, and enforcing them more effectively. It may be doubted, however, that further progress can be made this way. The other nations of the world are not prepared, as a *quid pro quo* for tariff cuts, to alter their plans for industrialization, to abandon their welfare programs, to forswear nationalization, or to forsake economic planning. A commitment to do any of these things, if made to us at all, would evoke resentment and ill will, providing the opposition party with a point of attack and the

government that made it with an alibi. It would lead to endless quibbling over the letter of the law, to departure from its spirit, and to defiance of its terms. And, though we might protest, we would do little more. The United Kingdom, despite an explicit commitment to eliminate her preferences as we substantially reduced our tariffs, has steadily refused to do so. And we have acquiesced, having no real alternative. The plain fact is that this country needs allies. However our friends behave, we cannot and we will not cut them off. Tighter commitments, even if obtainable, would be of dubious enforceability.

Given this situation, we can make more progress toward freedom of trade throughout the world by moving, swiftly and dramatically, to clear the international atmosphere. The American market can exert a powerful pull, inducing liberal policies abroad where tariff bargaining has failed. We should open this market to the world, not as an act of charity, but because it is in this way that our national interest will best be served. What are the prospects that we shall have the sense to do so?

### III

An open break appears to be impending within the business community between those industries that have long been sheltered by the tariff and those whose continued prosperity depends upon a thriving foreign trade. The American Tariff League, the National Labor-Management Council on Foreign Trade, and innumerable trade associations are still at work, representing the interests of weak and privileged industries. The importers and the bankers, as usual, are faithfully supporting the cause of freer trade. But there are growing signs that the exporting industries, too, are coming to political maturity. Reduction of tariffs, enactment of the customs simplification bill, repeal of the Buy American Act, and removal of the quotas on cheese and other goods have been recommended in recent weeks by spokesmen for important business interests. The National Association of Manufacturers has taken up the slogan of "Trade, not Aid." The National Foreign Trade Council has been told that "it is necessary now for this country to make painful economic adjustments, even if it means having a few of our domestic industries decline and die. If such industries can offer nothing better than the desire to continue operating behind tariffs and other restrictions, it might prove more economical if they were written off." The Detroit Board of Commerce has declared that "the essential and major industries in the United States today are well established! Mass production and efficient industries throughout the nation have nothing to fear from foreign competition." The Board has therefore recommended the enactment of a tariff law "consistent with the economic facts of our time—leading towards the eventual elimina-

tion of all tariff barriers in the United States."

The division in the ranks of industry is likely to be reflected within the government. On the one hand, it should be remembered that protectionism is the longest and strongest tradition of the Republican Party, that a majority of the Republicans in Congress has opposed the Trade Agreements Act every time (save one) when it has come to a crucial vote, that the Republicans wrote into the law the peril point provision, the escape clause, and the disclaimer of the GATT, that the party's platform in 1952 pledged it to "safeguard our domestic enterprises and the payrolls of our workers against unfair import competition," and that the leadership of the Senate and the chairmanships of the committees dealing with trade policy in both the House and the Senate will be in the hands of extreme protectionists. On the other hand, it must be noted that the President-Elect, who enters office with all of the prestige of a great popular majority, aligned himself during his campaign with the views of the economic internationalists. Trade, he was quoted as telling the reporters, is a two-way street and we must import if we are to export. Rather than continue "the purely temporary business of bolstering the free nations through annual hand-outs," he told the *Herald-Tribune* Forum, we "should seek out opportunities to increase imports of commodities, goods and services which will improve our own economy and help make our allies self-supporting." And he put this question to another audience at the Waldorf-Astoria: "Have we the vision to triumph over the temptations of economic nationalism and to welcome full, equitable trade with our allies?" The answer, he said, "must be a resounding, Yes!"

If the new President succeeds in reversing the position of his party on the tariff, his achievement will mark a turning point in the nation's history, as significant as the repeal of the corn laws in England a century ago. But the victory will not be an easy one. It should not be forgotten that Congress voted in 1947 to increase the duty on wool, failing only to override the President's veto, that the Senate cast a tie vote in 1949 on a bill to curtail imports of petroleum, the project being defeated by the vote of the Vice President, that the House voted in 1951 to impose a duty on tuna fish, and that Congress attached a rider to the Defense Production Act in 1951, and continued it in 1952, providing for the imposition of quotas on cheese on the ground that imports amounting to less than 5 per cent of the domestic output would endanger the nation's military security. Of all the fights that lie ahead, this promises to be the toughest one. It offers the new administration an acid test of its determination, its courage, and its capacity for leadership.



## STERLING CONVERTIBILITY AND SOME RELATED PROBLEMS

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In some papers read at recent meetings of our Association I think I have detected a note of profound discouragement, even of despair, about the prospects of a return to a regime of general currency convertibility in the foreseeable future. I should like therefore to address myself first to the general question of whether, nearly nine years after Bretton Woods, prospects for currency convertibility are getting better or worse.

I think that if "general convertibility" is taken to mean that anyone who holds any of the major currencies is free to spend it anywhere in the world, for any purpose, then the answer must be that the prospects have not grown much better since 1944. If, however, general convertibility is taken to mean freedom to use the proceeds of current transactions in international trade to make payments in any part of the world, I think the prospects are growing better. I think that it will be a very long time before a resident of the British Isles, for example, can go to his bank and buy dollars or francs or any other currency whatsoever without asking anybody's permission or without disclosing the purposes for which he wishes to purchase these currencies. But it may not be a very long time before the holders of sterling in what are now bilateral or transferable accounts will be free to transfer that sterling to anyone who wishes to buy it from them and will also be free to convert the sterling held in these accounts into dollars as the holders of sterling in the so-called "American accounts" can already do. That is to say that the sterling acquired by nonresidents of the sterling area will become generally convertible. This form of convertibility is sometimes, for lack of a better term, called monetary convertibility to distinguish it from full convertibility in a free market. It is compatible with a large amount of direct trade restriction and some control over international capital movements, but it has the great virtue of removing pressures for the balancing of international accounts bilaterally or regionally. It weakens some of the strongest motivations for the discriminatory application of trade restrictions, though I do not believe, as the ex-Chancellor of the Exchequer, Mr. Gaitskell seems to imply in a recent letter to the London *Economist*, that sterling area preferences, preferential treat-

ment of goods passing in intra-European trade and other forms of discrimination against American imports would necessarily or even probably disappear under a regime of monetary convertibility.

It is one of the merits of the European Payments Union (in my opinion almost its only great merit) that it has provided monetary convertibility over a wide area by removing pressures for bilateral balancing of trade within that area. It is one of its big defects that it also puts pressure on its members to achieve a regional balance with one part of the world. I should like to elaborate on this point a little.

If the European Payments Union is to be a permanent organization, each of its members will be permanently under pressure to adjust its foreign trade so that it will be more or less in balance with the other members of the Union as a group. If a member cannot do so, it will either build up a credit or debit position calculated cumulatively from some arbitrary date in the past. If a creditor, it will be forced to grant "automatic" credits to the other members. If a debtor, it will become some sort of a EPU problem child, which is not a pleasant position for any country to be in or for the other members to have to deal with. We have already seen such situations develop in spite of the system of partial gold payments which is designed to keep the Union from becoming frozen. I am afraid that the continuation of EPU as a permanent organization will perpetuate a situation in which the members have to struggle with two balance-of-payments problems rather than one. They will always have to try to keep their balance-of-payments position approximately in balance, not only with the EPU members as a group, but approximately in balance with the rest of the world. It is only fair to stress here that it is one of the merits of the system of partial gold payments under the Union that these two balances need only be approximate. Nevertheless, I think it is very strange economics for us to say to Belgium, for example, though you have attained over-all balance you must "correct" your cumulative creditor position with the other EPU countries and their monetary areas by reducing exports to them or increasing imports from them or exporting capital to them or granting them credits which may have an inflationary effect on your economy; and to say to them further that in order to do this you must also correct your debtor position with the dollar area by introducing new barriers to dollar imports, thus bringing great pain to some parts of the American government and to certain American business interests.

The prospect of an infinite series of efforts by the sterling area or by Belgium or Germany or other EPU countries to "correct" their balances of payments with one part of the world, no matter what their over-all position, is most unattractive. Such a way of running things

would, I am sure, be a hindrance to general convertibility. Furthermore, if experience to date is any guide, it would result in some members being periodically injured by efforts of other members to correct their EPU position. Schemes to avoid or mitigate this danger by multi-lateral administrative discrimination through the Managing Board of the EPU seem to me both politically inexpedient and administratively impossible, even though Professor Fleming argued for them most persuasively at the last annual meeting of this Association.

These observations have been directed against the notion of making EPU permanent. They have not been intended to minimize its achievements. Up to the present the regional approach of EPU has been a fruitful one for the attainment of general convertibility because it has relieved Europe of the intolerable burdens and frustrations of trying to operate a system of bilateral payments agreements that had become frozen. When these bilateral agreements were first made, and before they had become frozen, they were also an approach to the objective of convertibility because they made the first revival of intra-European trade possible. EPU is the second step. The third step to which I look forward is the dissolution of EPU when sterling becomes convertible and sterling convertibility is followed, as I am sure it will be, by the convertibility of several other European currencies.

When the National Advisory Council on International Monetary and Financial Problems first gave its blessing to EPU in 1949, it declared that "the establishment of the Union on a regional basis should not prevent any one participating country or a group of participating countries from moving as rapidly as possible toward currency convertibility independently of the rate of progress of other members." I believe that this was a sound policy then and is a sound policy now. If the EPU is so brilliantly successful as to bring about its own dissolution, the United States should be well pleased.

This brings me back to the central problem of sterling convertibility, on which the solution of so many other problems so largely depends.

A return to sterling convertibility has, throughout the postwar period, been a professed objective of British policy. But until about a year ago it was, as I think most Americans who have talked with or negotiated with British officials would agree, an objective to which only lip service was paid. It was something to be achieved in the dim future after every other problem was fully solved. This appears to be no longer true. For nearly a year convertibility has been discussed and planned for in quite a different way. It has become a medium-run practical objective of policy.

The statement issued at the close of the meeting of Commonwealth Finance Ministers on January 23, 1952, declared: "It is our definite

objective to make sterling convertible and to keep it so. We intend to work towards this goal by progressive steps aimed at the creation of conditions under which convertibility can be reached and maintained." The Commonwealth Economic Conference just concluded was concerned with these conditions. Some of them were described in its communiqué of December 13, 1952, with much greater clarity than others. Its approach to sterling convertibility was cautious. But it was not an approach of pious hope. It was one of action within the Commonwealth and of negotiation with the United States on practical problems.

I think the time has come when the British Government and at least a large number of British technicians and economists fully realize that Britain cannot continue indefinitely to be a banker for the sterling area and for other countries with a currency that is not good tender throughout the world. This change of attitude has in itself helped to stop the long-continued capital flight from Britain through loopholes in the British exchange control system and is partly responsible for the return of confidence in sterling as reflected in the exchange markets and, in particular, in those special rates that have for some years been used in "commodity shunting" operations.

Between the two Commonwealth meetings a great number of things happened that tended to bring convertibility of the kind that I have been speaking about appreciably nearer:

1. The adoption of a disinflationary policy in the first budget of the Conservative Government.
2. A decline and, far more important, a change in the composition of sterling balances. In the year ended June 30, 1952, Australian sterling balances fell from 720 million pounds to 350 millions, those of India from 660 million pounds to 340 millions, and those of New Zealand from 125 millions to 85 millions. There were also large decreases in the sterling balances of Pakistan, South Africa, Egypt, Israel, and Iran and some Latin-American countries, notably Argentina and Brazil. The major increases during the year were in the holdings of the EPU countries, the colonial areas, Japan, and some Middle Eastern countries. I do not mean to imply that sterling balances are no longer a problem, but only that they are not, as presently distributed, as formidable a problem as they were in earlier years.
3. A reduction in the annual burden of the rearmament program by lengthening the time period for carrying it out and thus reducing the pressure for conversion of export industries to rearmament.
4. The decision of the Commonwealth Finance Ministers last January to check the rate of capital export from Britain to the Commonwealth and thus releasing United Kingdom resources for other purposes,



particularly for export that would bring in foreign exchange currently. In their statement of last January, the Commonwealth Finance Ministers announced this decision diplomatically—pointing out that “for some time to come the Commonwealth will not be able to meet its growing needs entirely from its own resources, and many countries will therefore need to rely in varying degrees on investment from outside the sterling area.” But the meaning was clear enough and the point was reiterated in the communiqué of two weeks ago.

5. The continued success of Britain, even during a major exchange and reserve crisis in maintaining exports of record volume.

6. The dollar import restrictions adopted at the January meeting of the Commonwealth Finance Ministers.

I include these latest dollar import restrictions as a measure leading in the general direction of convertibility, whereas I would not have done so in the case of similar restrictions imposed in 1949. I think this position needs some defense. My reason is that these restrictions were imposed not as a cure-all but were regarded as a necessary but unpalatable step not to be repeated if at all possible. They were decided upon with great reluctance and for the first time import restrictions were imposed in conjunction with internal measures of disinflation. I think, therefore, that these restrictions were not essentially a new installment of an old policy but a necessary measure to gain time while a new policy was being worked out.

During the past year the United Kingdom has also taken some technical steps which are evidence of a firm intention to prepare the way for convertibility. One was the restoration, however limited, of the operation of a free foreign exchange market in London and in particular the first revival of the almost lost art of foreign exchange arbitrage in London. Another was the revival, also very limited, of international commodity markets in London and Liverpool. A third was the opposition of Great Britain to the renewal of EPU in June, 1952, for more than one year, which is reported to have been based on the view that a longer extension might interfere with Britain's plans for returning to currency convertibility and also Britain's support of a change in the EPU system of gold payments under which such payments by debtors would be reached more quickly than under previous rules. In this connection I was very interested to read in a *New York Times* despatch the other day that some of the experts engaged in drafting the long-awaited fourth report of the OEEC were adopting a very reserved attitude towards any steps leading to early sterling convertibility on the ground that they would be a threat to the continued existence of EPU.

In recent months British reserves—that is, the reserves of the whole



sterling area held in London—have been more or less stabilized, and have in fact risen slightly from their low point of 1,685 million dollars in June, 1952, to 1,875 millions in November, 1952. Over-all equilibrium in the United Kingdom balance of payments without taking into account American assistance under the Mutual Security Program was reached in the first half of this year. The United Kingdom's latest returns have been quite satisfactory in spite of difficulties in some branches of the export trade, and the communiqué of the Commonwealth Economic Conference noted with satisfaction that the sterling area as a whole will have achieved balance with the rest of the world in the second half of this year. Like all readers of the *London Economist* and the *London Cambridge Economic Service*, I am aware of the qualifications which must be made in looking at these figures and the dangers of interpreting them too optimistically. But I think that there are at least four quite solid reasons for viewing prospects of a return to sterling convertibility rather hopefully.

One I have already mentioned: that the British Government is actively preparing for it. Second is the acceptance at long last by the British Government of credit and fiscal policy as an instrument for restricting home demand and so contracting imports and releasing resources for export. Though in the opinion of competent experts (for example, the authors of this year's *OEEC Report on the Internal Financial Condition of Member and Associated Countries*) disinflation in Britain has not gone nearly far enough, there is good reason to suppose that the results already achieved have been encouraging to the British Government and have strengthened its determination to press on in this direction. Third is the fact that the sterling balances are now no longer considered by British Government technical experts as an insuperable bar to the restoration of convertibility. And fourth is the fact that the long period of improvident and excessive imports by some members of the Commonwealth—particularly Australia and South Africa—now seems to be coming to a close.

The communiqué of the Commonwealth Economic Conference does not deal with sterling balances, but it does deal with fiscal policy and the investment and development policy of the outer sterling area in a way which I find highly encouraging. All the Commonwealth governments agreed to "persevere" in their efforts to combat inflation. The Conference agreed that in the sterling area countries development should be concentrated on projects which directly or indirectly contributed to improvement in the area's balance of payments with the rest of the world. The criticism of the kind of overindustrialization which has taken place and which has been harmful to this objective is unusually frank for a document of this kind. The United Kingdom also

lays down a condition for the provision by it of additional capital for Commonwealth development: that the country receiving the capital must satisfy the United Kingdom that an adequate portion of its resources will go into investment designed to improve the balance of payments. The meaning of this condition must have been crystal clear—especially to Australia.

I think that this good advice, which resembles the advice given by the United States to underdeveloped countries in the United Nations, is well calculated, if followed, to reduce the disproportionately large contribution of the outer sterling area to the balance-of-payments deficits of the area as a whole. Since in the matter of investment it carries a sanction behind it, it will probably be taken seriously.

While I believe that the most hopeful augury for a restoration of currency convertibility is the revival of monetary and fiscal policy as a major instrument for forcing countries with inconvertible currencies to live within their means and thus take the basic steps in preparation for convertibility, I also believe that the convertibility which can be achieved by the efforts of these countries themselves in the near future must be accompanied by continued trade restrictions, some of them discriminatory, unless the United States is able and willing to do a great many things which it now seems very little inclined to do. Although I know that Professor Viner for one does not quite agree with me, I think that checking inflation in the United States is one of the most important of these.

The hopes entertained by some foreign delegates at Bretton Woods, especially the British delegates, that a more rapid rate of inflation in the United States than in their own countries would be helpful to them in solving their own balance-of-payments problems were based on the assumption that there would be no serious inflation in Europe. They have consequently been disappointed. But even if this assumption had proved to be well founded, I do not believe that more rapid inflation in the United States than elsewhere would have been a sound solution to the problem. I am convinced that only if the United States gradually builds up confidence on the part of other countries that the American economy will be much more stable than it has been in the past will they ever be induced to take the risk inherent in full convertibility, not only of their currencies when held by foreigners, but when held by their own citizens.

At the risk of repeating a good deal of what Professor Wilcox has said much better and of making my paper read like a check list, which I do not like to do, I shall enumerate some of the other steps which seem to me important if America is to make a significant contribution to convertibility, not only in the narrow monetary sense, but in the

full sense of the term. One step is to make some practical contribution towards increasing the long-range stability of raw materials and mineral prices. A discussion of this topic would lead us into the controversial field of buffer stocks, long-period bulk contracts and commodity agreements which I am not competent to discuss and which in any case there is not time to go into here. But the communiqué of the Commonwealth Economic Conference makes it certain that some American contribution to stabilizing these prices over long periods will soon be formally demanded of the United States as a partial *quid pro quo* for progress by the Commonwealth towards sterling convertibility. The prospects of full convertibility therefore depend very largely on whether or not the United States can find some practical means of responding to this demand. Another necessary step would be to pass a more thoroughgoing custom simplification bill than the one presently before Congress. I have in mind the elimination of all exceptions to the rule of foreign valuation. More important is a reversal of the present trend towards undermining the American foreign trade policy of the past decade. More than a simple reversal of these trends is, in my opinion, as in that of Professor Wilcox, necessary. We should make a beginning in making tariff reductions without demanding reciprocal concessions in return in every case. It would seem that progress in trade barrier reduction by the method of reciprocally negotiated concessions may nearly have reached its limit and that more could be accomplished in this field by the force of example on the part of the United States than by persuasion, pressure, or negotiation. I am much gratified that Professor Wilcox has strongly stressed this particular point.

Another contribution would be to liberalize present rules of the International Monetary Fund concerning the use of its quotas and to couple this with fixed repurchase agreements along the lines recommended by the experts' *Report to the United Nations on Measures for Internal Economic Stability* of last year; that is, the Angell report. The United States should in addition lend steady encouragement to the new policies of the International Monetary Fund of putting their resources to work; and if these policies are successful, it might be wise to increase the resources of the Fund. The United States should, I think, also lend its support to the creation of a new organization affiliated with the International Bank for Reconstruction and Development, along lines already proposed, which could make equity investments in foreign enterprises without demanding a government guarantee in every case. Another contribution of first importance would be not to draw any rigid line between the areas in which the United States Government and American private foreign investment are considered to

be suitable, in order to ensure that an adequate flow of foreign investment will be forthcoming even when not available from private sources. Unless required by overriding security considerations, the United States should not, in my opinion, make loans or grants to countries which are unwilling or unable to take the steps necessary to put their financial and fiscal systems in order. Another major contribution to general convertibility would be to make every effort to avoid tied loans and grants whether hidden or open. The United States should, moreover, be willing and prepared, when the time comes, either to negotiate substantial stabilization loans for countries that are ready to make their currencies convertible or to participate in such stabilization loans through the International Monetary Fund. In the meanwhile, convertibility would be promoted if the United States accepted the building up of reserves as a suitable objective of American foreign assistance—which has not been true in the past.

As far as a stabilization loan is concerned, of course, everything depends on what is meant by "when the time comes." If we accept the gloomy prognostications of the London *Economist* in its recent articles on "Living with the Dollar" that there is in prospect a chronic world dollar deficit of from 5 to 8 billions a year (10 billions if discrimination is given up), the time will never come. If we accept the more optimistic estimate of Mr. Ivar Rooth, of IMF, that 1952 will end with a world dollar deficit of only 2½ billions (excluding military shipments specially financed) as contrasted with a world dollar deficit of 12½ billions only six years ago, we may hope that the conditions for a stabilization loan, as distinct from another American handout, may be established in a relatively few years.

If discussion of a stabilization loan is now premature, so, in my opinion, is serious discussion now of an Atlantic payments union (the Keynes plan except that creditors are not to be asked to pay interest). One thing has impressed me in *The Economist's* argument for such a clearing union: even with the huge dollar credits to be provided under it, it can only be prevented from becoming frozen if the debtor countries carry out vigorous disinflationary policies, if the United States increases its imports and invests more abroad, and if the United States finances rearmament in such a way as to provide Europe with a large amount of free dollars. These are precisely the remedies which *The Economist* shows, to its own satisfaction, will not, if relied on now, be adequate to solve the dollar deficit problem. It would be much wiser, I think, to press forward with the constructive measures which it is generally agreed would be helpful and see how they work out before reviving the Keynes plan. The results might surprise us.

This check list can be added to, but if the United States follows

this prescription and the countries with inconvertible currencies impose some internal discipline through credit and fiscal policy, it will be quite enough to bring full convertibility back into the area of practical politics. Time has not permitted me to deal with many important problems related to convertibility—particularly the problem of whether or not under present conditions convertibility can be achieved with fixed exchange rates or whether flexible exchange rates are essential to it and also the problem of whether the gap between the productivity of the United States and productivity in other countries is destined to produce "a chronic dollar shortage" which can be covered only by a constant stream of American assistance in one form or other.

The argument that currency convertibility under present conditions can only be achieved with flexible exchange rates rests fundamentally on the view that it will be impossible to introduce sufficient flexibility in the internal economies to make necessary adjustments to external conditions required by fixed exchange rates. The notable revival of monetary and fiscal policy in a number of important countries and the success which has been achieved by it in correcting balance-of-payments difficulties seem to me greatly to weaken the force of this argument. Moreover, the argument for a flexible dollar-sterling rate seems to me to be at least partly based on a misunderstanding of how the old gold standard used to work. Many of the necessary adjustments were made by short- and long-term capital flows and by price adjustments that were continuous and gradual and which did not have to be enforced by draconian deflationary policies. When price levels really got out of line, exchange rate adjustments were made, but the exchange flexibility was in currencies that were not of major importance.

In my opinion, it is not to the interest of the United States or of the United Kingdom that other countries should be forced to choose again as they did in the early twenties between stability in sterling and stability in dollars. It is one of the penalties of being a major country whose currency serves as a general medium of financing international trade that it has much less freedom to shift its exchange rate about than other countries have. Here again I am on very controversial ground, but I hope that in this company at least, it will not be considered controversial to state that the notion of the indefinite and chronic "dollar shortage" due to different rates of productivity is an illusion. I for one still believe in the doctrine of comparative advantage.



## REFLECTIONS OF THE FUTURE OF THE BRETTON WOODS SYSTEM

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### I

When I speak of the future of the Bretton Woods system, I do not think of the International Monetary Fund as an institution. I have the utmost confidence in the staying power of a bureaucratic organism—national or international, but especially international—even one that cannot boast of such an exalted level of technical excellence and competence as this particular one.

By Bretton Woods system I mean the principle of multilateral, non-discriminatory trade and convertible currencies of which the Articles of Agreements on the International Monetary Fund is one of the symbols and expressions.

I do not think there is anybody who would argue that the Bretton Woods Program was an outstanding success. Many experts would, on the contrary, agree that it was up to now a dismal failure. Quantitative trade restrictions have not been much reduced, convertibility not restored, exchange control not abolished; every other year there is a new balance-of-payments crisis, and where there have been moderate successes in freeing trade and making currencies partially convertible or transferable, it was on a regional, that is on a discriminatory, basis as within the European Payments Union and the sterling bloc.

I shall argue that the situation is not as bleak as this enumeration of failures suggests and that the possibility of moving towards convertibility exists, if it is really wanted. But there is no denying the fact that the very persistence of balance-of-payments difficulties makes it more and more difficult to alter the course of policy and to do something effective about it. The main reason is that the persistence of the dollar shortage and the recurrence of acute crises—the long series of disappointments—seem to confirm the views of those who believe in an incurable dollar shortage and make others fainthearted and unsure of their beliefs.

It seems to be a law of human nature—which holds not only for economics but also for politics and other spheres—that situations which exist long enough acquire a normative power and are apt to be

accepted as the unalterable results of deep-seated maladjustments, not simply the consequences of a series of misfortunes and of misguided policies. If a depression lasts a few years, it is regarded as a secular stagnation and economic theory adjusts itself to the "new" situation by becoming depression economics. Every prosperity which does not fade quickly becomes in the eyes of many a new era. If a political regime, however detestable, stays in power half a decade, it is hailed as the "wave of the future."

And if the United States has a favorable balance of payments for a series of years, more and more people become convinced that it is a case of an incurable disease, of Midas touch alias dollar shortage.

## II

To me all this pessimism and defeatism seems entirely unwarranted, superficial, devoid of historical sense and perspective and in glaring contradiction to elementary principles of economic theory. An objective examination of the postwar development discloses, in my opinion, that, despite the recurrent dollar crisis and the persistent United States surplus, the situation has greatly improved and that the objective conditions—as distinguished from political and psychological prerequisites—for a restoration of convertibility are now more favorable than they ever have been since the end of the war.

Over-all output and the volume and value of trade have everywhere grown fast and almost uninterruptedly. Value and volume of exports of many key countries—United Kingdom, Germany, and Netherlands, for example—have risen very promisingly.

On the other hand, United States imports have grown fairly continuously, not only in value, but also in volume (with a slight recession in 1949), and the recurrent spurts in the United States export surplus are mainly due to jumps in exports rather than to drops in imports. That seems to me a highly significant fact, which strongly suggests that the periodic recrudescence of the dollar scarcity is due to periodic changes in foreign demand caused by spending sprees, delayed adaptation to unfavorable changes, relaxation in credit and import controls and the like rather than to fluctuations in United States demand. Also, in the long run the U.S. surplus is due to increased demand for dollars rather than to decreased supply. How much better the situation is today than it was a few years ago becomes clear if we reflect that the British crisis in 1951 was handled almost without United States aid, whilst the 1947 and 1949 crises occurred during a period when the United Kingdom was receiving massive help.

Another favorable factor of the greatest importance is the "rediscovery of money" and of monetary policy, to use Professor Ellis'

telling phrase, in many countries and the quick and spectacularly favorable response in the Netherlands, Germany, Denmark, and elsewhere to the classical medicine of deflation or disinflation.

On the other hand, in most cases where there occurred a deterioration in the balance of payments, it can be easily traced to inflationary excesses. In this connection, I should like to mention that I have been impressed by the fact that the old-fashioned purchasing power parity works so well. While we economists speculate about elasticity, absorption, etc., the crude instrument of international price comparisons seems to be often much more serviceable. Note the striking tables in the "Report by a Group of Independent Experts: Bresciani-Turroni, Lindahl, Marget, Masoin, Rueff, Schneider," *The Financial Situation in Member and Associated Countries* (published by the OEEC, Paris, 1952, pages 54-55). These tables show that, almost without exception, in countries whose balance-of-payments situation has deteriorated in 1951, prices and wages have risen sharply (since 1950) as compared with the United States, whilst no such pronounced rise occurred in those whose balance of payments improved or remained stationary.

The upshot of all this is that conditions have become much more favorable for making progress in the direction of convertibility and multilateral trade than they were for a long time.

### III

It will be objected that, granting all that, the fact remains that there still exists a large dollar deficit, even in good years, and that even those countries whose over-all balance of payments has greatly improved (United Kingdom in 1950 and Germany in 1951) have not been able to come near an elimination of their dollar deficit.

Furthermore, it will be said that it is entirely compatible with the theory of an over-all, stubborn dollar shortage that individual countries can improve their over-all balance of payments by the classical method of deflation. If some members of the nondollar world pursue inflationary policies, it is comparatively easy for others by restraining themselves to improve their situation at the expense of the former. From that it does not follow, it will be argued, that if all restrained themselves, if all pursued disinflation, they could with similar ease improve their collective position vis-à-vis the United States.

I would not deny that there is some justification for this argument. It is certainly easier to sell in a nice inflationary market nextdoor than in the competitive United States market; and it is very easy, for that matter, to increase unrequited exports, because all you have to do is to release some blocked balances. (It is an instructive thought, it seems to me, that this kind of exports could be easily expanded to

dollar countries, say, in South America—if not in North America. These countries would be very happy to receive grants-in-aid from Europe and spend them in Europe, if they were available!)

But the other side of the medal is, of course, the fact that the easy access to inflationary markets nextdoor (especially when they are in the EPU area and thus are paid at least partly in gold and when quotas and other devices against United States imports assure handsome profits to those who are exempted from those restrictions) and unrequited exports to the sterling area leave less for exports to the dollar market; these possibilities, like inflationary pressure at home, pre-empt the potential supply and leave *pro tanto* less incentive and fewer goods for sale in the dollar area.

I therefore conclude that the real test has not yet been made. Naturally, so long as important members of the nondollar area are under strong inflationary pressure, not only their dollar balance but also the dollar balance of those who are nearer to, or in, over-all equilibrium will remain upset—at least so long as there are means available to finance the world dollar deficit. I am convinced that if the inflationary patches in the nondollar world were mopped up or at least their drain on the resources of the rest discontinued, the dollar balance would quickly improve.

#### IV

Now, supposing all this is true and that the present conditions are really propitious—or at least more propitious than they have been since the end of the war—for moving toward convertibility, how should we go about to achieve that goal?

As far as the basic prescription is concerned—stripped of all strategic and psychological consideration and disregarding existing superstitions and problems of administrative and political feasibility—I have nothing new to offer; I am convinced that there exist no magic formulae, no clever gadgets, which would carry us easily and painlessly to convertibility. The basic prescription is this: Let exchange rates find their equilibrium level, avoid inflation, and apply disinflationary policies. I am convinced that if exchange rates were set free and countries pursued what Meade calls “policies of internal balance” (i.e., keep internal money wage level approximately stable), the balances of payments would quickly equilibrate themselves without sharp shifts in the terms of trade.

Now I realize that such a radical solution—a “dash towards convertibility”—has no chance of adoption. I am not even sure I would myself recommend such a drastic remedy. A more gradual approach may be preferable and, even assuming prudent economic and financial

policies, capital convertibility could probably not be recommended, at least not for countries which are subject to political scares.

But I do not want to go once more into these basic questions which have been so much discussed. As a sort of background, let me simply make my position clear in these matters and then discuss some specific problems.

In the absence of widespread unemployment, any improvement in the balance of payments, however brought about, implies a decrease in "real expenditure," consumption, and investment, because if exports rise and/or imports fall, less is available for domestic use.<sup>1</sup> This unavoidable decrease in real expenditure I call the primary burden of equilibrating the balance of payments. This primary burden can be either magnified by a "secondary burden" or reduced by a "secondary benefit." We have a secondary burden, if as a consequence of the method used for the elimination of the deficit, e.g., as a result of devaluation, the terms of trade deteriorate. If the terms of trade improve, we have a secondary benefit. What happens to the terms of trade depends on the much debated elasticities of demand and supply of exports and imports.<sup>2</sup>

The secondary burden is the same thing as the so-called "transfer burden" or "transfer problem" in contrast to the problem of raising the sums to be transferred as reparations.

Today's "elasticity pessimism"—to use Professor Machlup's apt phrase—with respect to the chances of eliminating the dollar deficit by orthodox means, parallels the transfer pessimism in the German reparations debate. Keynes was the most influential pessimist in the twenties, whilst he was an optimist in his posthumous article on the prospects of the United States balance of payments.

There is, however, one important difference between the pessimism then and now—a difference which, as far as I can see, has never been pointed out. At that time it was doubted by the pessimists whether Germany could transfer reparations to France, Great Britain, Belgium,

<sup>1</sup> What S. Alexander calls "absorption" ("Effects of a Devaluation on a Trade Balance," in *Staff Papers*, IMF, Vol. II, No. 2, April) is nothing but another word for "real expenditure." It is, however, misleading to oppose the "absorption approach" to the "elasticity approach." "Absorption" and the "propensity to import or to absorb" as well as the price elasticities are important for the outcome. In other words, not only price effects but also income and expenditure effects are relevant. How they interact has been made clear by Meade in his book on *The Balance of Payments*.

<sup>2</sup> There may be a secondary burden of another kind; namely, unemployment either in the surplus or the deficit country. If a deficit country deflates with rigid wages, unemployment will result. (A certain amount of deflation—called disinflation—is usually possible which does not entail unemployment, because it cuts into prices and profits, not yet into wages. This possibility depends on the fact that prices usually move ahead of wages in the inflationary process resulting in excessive profits.) On the other hand, reduced exports and increased imports may produce unemployment in the surplus country. I am not discussing this kind of secondary burden. It certainly can be avoided by skillful monetary and fiscal policy.



etc. Now suppose it were possible to raise reparations from Germany (which is, of course, politically impossible), would anybody doubt that they could be transferred? The answer is, I believe, emphatically "no"! (Vide the British and French deficit in EPU and the German surplus.) The present pessimism is in a sense the opposite of that in the twenties. While then it was doubted whether the United Kingdom, France, etc., could have unilateral payments transferred to them, now it is doubted whether they could do without unilateral payments (United States aid). If it really was harder in the twenties to transfer reparations into France and Great Britain than it would be now, the reason is surely not that then the elasticity of British and French demand for imports was smaller than it is now. (Since in both countries protection is much more severe now than in the twenties, one would expect the opposite.) The real reason is that there is inflation and full employment. It is tempting and would be instructive to pursue this line of thought, but I must return to my main argument.

There is less "elasticity pessimism" today than there was a few years ago although it has by no means disappeared entirely as, for example, the recent writings by Thomas Balogh and by J. H. Williams (see his beautiful Stamp Memorial Lecture) and articles in *The Economist* demonstrate. (See especially the symposium, "Living with the Dollar," in the issue of November 22, pages 580-596. There it is first argued that the dollar gap cannot be eliminated by nondiscriminatory means; then a nondiscriminatory Atlantic payments union is proposed to which the United States is invited to contribute 35 billion dollars.) Many writers have adopted a more optimistic attitude, to which I completely subscribe.

The impression that balances of payments are inelastic with respect to changes in exchange rates stems, I believe, from the fact that depreciating countries often find it very hard to resist inflationary pressure, which is, of course, intensified by devaluation. In other words, they are unable to pursue a policy of "internal balance." This is, in turn, the consequence or perhaps an expression of an unwillingness or inability to bear the burden entailed by the disappearance of the deficit in the balance of payments.

The size of the total burden—and hence the chance that it will not upset the policy of "internal balance"—depends on the magnitude of the deficit in comparison with the national income (primary burden) and on the extent to which the primary burden is magnified by a deterioration in the terms of trade (secondary burden).

This second factor has been, I believe, greatly exaggerated. It is by no means certain or even probable that there will be a secondary burden rather than a secondary benefit. Even if the position taken here,

that as an almost universal rule international elasticities are large enough (at least in the somewhat longer run) to exclude the possibility of an unstable equilibrium (i.e., that a devaluation under a policy of internal balance will fail to reduce the balance of payments), the terms of trade may just as well improve as deteriorate.<sup>3</sup>

To sum up: In my opinion it cannot be doubted that the primary burden is tolerable for all countries (with one or two exceptions), and in my judgment there is no danger that it would be greatly magnified so as to make it intolerably large if nondiscriminatory methods are used to fill the dollar gap.

## V

This, then, is my general position in these matters. But instead of defending and elaborating it, I should like to discuss a few specific points—some changes in policies and procedures which, in the light of the general theory as well as of the experiences gained since the inception of the Fund as an operating agency, would seem to be essential for the attainment of its basic objectives. Some of these changes could be effected within the framework of the Articles of Agreement; others may require renegotiation of the Fund Agreements. This latter question is, of course, a legal one which must be left to the lawyers who have shown great ingenuity in drawing reasonable conclusions from inadequate or even absurd premises.

It seems to be clear by now that the experts assembled in Bretton Woods paid much too little attention to the problem of inflation. Like so many experts in the economic field and elsewhere, they were pre-occupied with fighting the last or last but one crisis, with deflation rather than inflation, with competitive depreciation rather than with overvaluation and reluctance to adjust the exchange rate.

The Fund will have to concern itself more intensely with the internal economic and financial policies of various countries than was contemplated by the authors of the Articles of Agreement. (The original Keynes plan was even weaker in this respect than the Bretton Woods plan and would have been unworkable for this reason, although it was perhaps superior in other respects.)

It is, of course, easier to say that this is necessary than to indicate

<sup>3</sup> On this point, compare my paper, "Currency Depreciation and the Terms of Trade," in *Wirtschaftliche Entwicklung und Soziale Ordnung* (ed. by Lagler and Messner, Vienna, 1952) and the literature quoted. It is true, the British terms of trade did deteriorate after the devaluation of 1949. But this was probably to a considerable extent due to business revival in the United States. At any rate, the big deterioration which came in 1950 was primarily a consequence of the post-Korea boom. This diagnosis is supported by the fact that the United States deteriorated fully as much as the British and that those of Australia, a depreciating country, improved. On all that, compare R. Hinshaw, "Currency Appreciation as an Anti-inflationary Device," *Quarterly Journal of Economics*, November, 1951, and February, 1952.

how it could be done. Exhortations are clearly not sufficient. Suspension of the right to borrow is not sufficient either, at least so long as the financial activity of the Fund is not more lively than it was in the past. I shall say a little more on that later.

An equally serious defect of the present system is the rigid attitude with respect to exchange rates. The law ought to make it permissible for a country to adopt a system of freely fluctuating exchanges without being cut off from support from the Fund, and the Fund ought to be able to make not only a once-for-all adjustment in the exchange rate but also the introduction of freely fluctuating rates, at least for a limited period of time, a condition of financial assistance. Certainly the policy of accepting unrealistic par values should be changed.

It seems to me that, as a means of initiating an adjustment of exchange rates, foreign exchange retention schemes, broken cross rates, and similar devices have a certain value. True, these practices are a nuisance; but if they are gradually generalized and thus become a wedge driven into the tight rate structure, loosening it up and preparing the way for a general adjustment of currency values as well as serving as a barometer for the true value of a currency, they have a very useful function to perform. Some indulgence, a little less insistence on "orderliness," some prodding to generalize rather than to discontinue such practices on the part of the Fund might be desirable.

In both respects—in exerting influence on members to control inflation as well as in suggesting necessary changes in currency values—the Fund would be in a stronger position if it could use its resources more freely as an inducement. Moreover, the help of the Bank should be enlisted. Loans by the Bank should be made conditional upon certain minimum requirements with respect to controlling inflation and establishing realistic exchange rates.

Maybe existing resources, whittled down as they are by inflation, are insufficient to do much in this direction. I have no idea whether there is any chance to increase them. But if there exists such a chance, it can hardly be realized without a convincing plan. Moreover, if it were possible to point to a few cases where such a policy has succeeded, the chances of strengthening the resources of the Fund would certainly be much increased.

## VI

To illustrate what might be achieved by concentrating efforts at a strategic point, let me call attention to the fact that inflationary pressure, coupled with rigid exchange rates, not only ruins the balance of payments of the country concerned, but also prevents triangular trade settlement and thus causes difficulties for other countries. For example,

it would seem to be natural for Europe to eliminate her present deficit with the United States, at least partially, in a triangular fashion; namely, by developing a surplus with Latin America and other raw material exporting countries which, in turn, would have a surplus with the United States. There can be no question of inelastic demand, and all the real and alleged difficulties of penetrating the United States market do not exist in that case. Europe should be able to replace many United States exports to Latin America; it is entirely a question of price. It might be objected that it is also a matter of marketing connections, advertisement, habits, and, some might add, of more or less irrational preference for American goods (particularly for consumer goods). I would not deny that these factors may have some importance. But I think the argument cuts the other way. European connections with Latin America and South East Asia are at least as good as those of American firms. I am convinced that price and quality are the main factors. In some cases, the quality of United States goods may be (or have been) better; e.g., in trucks and road-building machinery. But European industries do catch up quickly.

There is no danger that the United States might insist on bilateral balancing of her trade. What prevents this triangular adjustment is either too high European prices or too slow delivery, which can be explained only in terms of inflation and overvalued currencies in Europe or—and this is the point I wish to stress here—to inflation and overvalued currencies in the Latin-American and other raw material exporting countries. If these countries, because of inflation and rigid exchange rates,<sup>1</sup> suffer from an over-all deficit in their balance of payments, they cannot be expected to play the game of triangular trade. They will insist on spending all the dollars they earn for imports from the United States instead of using some of them for purchases from Europe; they will force Europe to buy as much from them as they buy from Europe. In other words, repressed inflation and overvalued currencies lead inescapably to bilateralism.

It is interesting to observe the difference between the British Colonies (Malaya, West Africa, etc.) on the one hand and the independent members of the sterling area on the other in this respect. The former are under strict discipline and earn dollars, while the latter (Australia is a glaring example) pursue inflationary employment and industrialization policies and use all the dollars they earn for themselves. It is another question that these colonial countries do not only earn currently dollars for the dollar pool, but have accumulated sterling balances of over 500 million pounds since 1947. According to *The*

<sup>1</sup>Open inflation with freely fluctuating exchanges would not interfere with triangular trade. It is the artificial exchange rate and repressed inflation that cause the trouble.

*Economist* (October 11, 1952, page 114), "West Africa and Malaya seem to have been only second to the U.S. as capital exporters in the last few years. Many Australians would no doubt be surprised to know how far their uneconomic industrialization has been financed by Mr. Nkrumah's Point Five aid."

Obviously, such a triangular adjustment would be in the interest of all concerned (excepting, of course, the development mentioned above). It would be easier and cheaper for Europe to get into dollar balance. Latin America would get her imports at more favorable terms and the United States could cut down on European aid and enable the American taxpayer (by means of tax reductions) to increase his expenditures by as many dollars as exports to Latin America have fallen. It goes without saying that larger United States imports from Latin America, etc., as well as untied dollar loans to those countries, would greatly facilitate the adjustment and increase the scope of triangular trade.

If it were possible to demonstrate this possibility by inducing some country or countries, say in Latin America, to permit such triangular trade to develop, others might be encouraged to follow the example.

## VII

I now come to the last subject on which I should like to make a few remarks: the problem of regionalism in the field of international payments, EPU, and sterling area.

There are a number of weighty objections against regional payments unions:

1. They do not solve the problem of multilateral trade if the triangular circuits go beyond the particular region, as they practically always do. What I just said about the triangle, Europe-Latin America-United States, illustrates the point. Taken separately, the sterling area is in a better position in this respect than EPU, because the former contains the dollar-earning colonies. For that reason, the interconnection of EPU and the sterling area is very important but not sufficient because the combined group leaves out Latin America and other areas.

2. If some members of such a regional payments union lack discipline and go on an inflationary spending spree, they sap the strength of the whole group by losing dollars outright and drawing on the central pool of dollars and by sucking in through imports resources from the stronger and more disciplined members, thus reducing the dollar earning power of the whole group. This has been especially true of the sterling area.

3. As a consequence, the functioning of any such unions is always threatened by the emergence of large debtor and creditor positions. We can distinguish two types of balances: "equilibrium" or "structural"



balances and "disequilibrium" balances. The former result from the fact that, even if the whole group is in balance with the rest of the world, there will always be some members who have deficits with the outside world offset by surpluses with the rest of the union and others who have surpluses with the world offset by deficits with the union. The former should be allowed to draw dollars from the union pool, while the latter should pay dollars into the pool.

Disequilibrium balances arise from two sources: because the inflationary pressure or degree of overvaluation of the various currencies is not the same for the various members of the group and because the degree of tightness of restrictions on imports from the dollar area is different,<sup>5</sup> and hence there is a constant inducement to transship dollar goods (processed or unprocessed) from the liberal members of the group to the restrictive members.

Both the Sterling Union and the European Payments Union have been plagued by the appearance of these two types of disequilibrium balances, and their respective histories can be written in terms of a description of their continuous struggle against precisely these difficulties. The problem is to maintain discipline; i.e., to insure a certain uniformity in internal monetary and fiscal management for the purpose of preventing inflationary excesses and in the degree of stringency of import restrictions from the outside. For example, Belgium, with its liberal import policy, had to take measures to restrict imports from the dollar area and exports to the EPU countries. Either the liberal members have to adjust their import policies to that of the protectionist members by becoming less liberal or the protectionist members have to adapt their policies by becoming more liberal.

In practice it is very difficult to distinguish between the unobjectionable equilibrium and objectionable disequilibrium balances, because the equilibrium pattern of trade is not precisely known and must be assumed to be subject to frequent changes. This adds greatly to the difficulties of the management of payments unions.

4. Even if the union succeeds in overcoming these difficulties by keeping sufficient discipline and operates with tolerable technical efficiency, there remain all the objections to discriminatory treatment of outsiders. Discrimination is, of course, implicit in payments unions as much as in customs and full economic unions. As Professor Ellis has pointed out in *The Economics of Freedom* (page 501), the economic effects of payments unions have to be judged by the same criteria as customs unions and preferential tariff regimes. I cannot possibly discuss the problem of discrimination within the space of this paper. Suffice it to

<sup>5</sup> The two factors are, of course, related. The greater the inflationary pressure, the more stringent must be restrictions on imports from the dollar area.

say that the basic objection against any kind of discrimination is that it constitutes an infringement upon the optimum conditions of international division of labor and therefore entails a diminution of world income as compared with a nondiscriminatory free trade position. To illustrate: If Latin America were introduced into EPU in order to substitute imports from Europe for imports from the United States by means of discriminatory methods, it would get its imports at less advantageous terms than if the substitution were accomplished by the nondiscriminatory method of Europe underselling the United States (e.g., by means of currency depreciation).

This general, theoretical argument against discrimination does, of course, not dispose of the whole problem. But before outlining a possible case in favor of such discriminatory regional arrangements, let me reject two arguments which seem to me entirely untenable.

Discrimination against the dollar area and other hard currencies is often advocated as a device of "soaking the rich"—frankly and openly by Thomas Balogh and Richard F. Kahn, implicitly and vaguely by many others. Even granting the ethical judgment that the rich should be soaked, the argument seems to me entirely unacceptable because there are poor countries in the dollar area (e.g., Mexico as compared with Western Europe, not to mention the United States south); because if you start using international economic policy for that purpose, poor countries all over the world have to discriminate against the rich ones and among the rich areas is Western Europe, where the whole theory originated; because the policy is technically, administratively, and politically unworkable in a tolerably efficient fashion.

Similarly untenable is the view that discrimination against the United States is necessary because it is the only way of coping with the Midas touch of the American economy. This argument is strictly speaking a more extreme version of the previous one, although it lacks the ethical overtones. It is more extreme, because it assumes a highly inelastic balance of payments (the elasticity in the Metzlerian sense being zero or negative), while the preceding one need not make such an extreme assumption. Since I regard the incurable dollar shortage as a myth, I refuse to believe that discrimination is necessary to cure it. The dollar gap can be eliminated without the use of discriminatory methods.

The only grounds on which such regional arrangements can be successfully defended are, I believe, reasons of political and administrative expediency. Only a small group of not too heterogeneous countries, it might be argued, can possibly agree on the minimum of uniformity and self-restraint in the field of monetary and fiscal and exchange rate policy that is necessary to operate a multilateral trading system. Hence

the alternative of such discriminatory arrangements as EPU or the sterling bloc would not be freer nondiscriminatory trade but more bilateralism.

This line of reasoning cannot, in my opinion, be dismissed lightly and a priori. The answer must depend on the amount of liberalization which these arrangements actually entail;<sup>6</sup> the extent to which their existence, by the previously described process of the weaker and undisciplined members sapping the strength of the stronger, self-disciplined members, prevents or postpones the attainment of general convertibility; and on one's judgment about the chances of persuading, cajoling, inducing numerous countries using the carrot or the stick to move towards full convertibility.

I personally am still skeptical with regard to the regional approach, although I concede that it is a question on which "reasonable men may well disagree." Especially if one takes into consideration the prevailing disbelief in the efficacy of more orthodox straightforward methods, the fashionable predilection for complicated "gadgets" among skillful technicians and the superstitious awe with which such gadgets are regarded by politicians and statesmen, one may well reach the conclusion that such discriminatory unions are the lesser evil.

I am also ready to admit that EPU has functioned better than I had thought possible. This moderate success poses the challenge to find out what we can learn from it. Perhaps it teaches lessons which can be applied on a global basis without the discriminatory features.

It has been said that the automatic functioning of EPU, the automatic creation of debits and credits resulting from the channeling of all payments balances through the union, and the progressively increasing gold payments distinguish the EPU method favorably from the Fund technique under which each credit ("purchase of currencies") has to be negotiated separately. Without any intention of belittling the elegance and ingenuity of the EPU construction, I do not believe that the automaticity of its operation is the secret of its moderate success; nor is it an essential differentiating factor as compared with the Fund. I am sure the Fund could work out, within the Articles of Agreement, a broadly equivalent technique, by means of generalized stand-by arrangements and appropriate repayment provi-

<sup>6</sup> I find it impossible to form a judgment as to the extent to which inter-European trade has actually been liberalized by EPU. True, on a certain percentage of private imports quotas were removed under various "liberalization" programs. (For details, see W. Diebold, *Trade and Payments in Western Europe*, New York, 1952.) But the global percentages do not tell much. Many concessions have again been withdrawn. At any rate the optimistic expectations of the proponents and defenders of EPU that EPU would greatly increase competition, eliminate high-cost producers, and thereby tend to increase the "viability" of the whole area have hardly been fulfilled, because quota reduction has largely been confined to noncompetitive items.

sions. I have not figured out how the Fund quotas and resources compare with those of EPU. There may exist significant quantitative differences between the two institutions. I would not deny that anything can be learned on a purely technical level from EPU. But the factors discussed in the text below seem to me much more important than the technical details.

It seems to be clear, however, that at this time it would not be advisable to introduce such an automatic system on a global scale because the result would be a rapid drain of all the hard currencies from the Fund.

The secret of EPU's moderately successful functioning lies not in its technical features, not in its nature as a gadget, but rather in the fact that it is composed of a small number of fairly homogeneous countries and that these countries co-operate closely, having intimate consultations at the highest level. It is easier for Western European statesmen to meet regularly in Paris and adjust their economic and financial policies than for the representatives of fifty-odd nations to agree on anything at Fund headquarters in Washington. In the small EPU managing board and the OEEC council, the really responsible leaders of their countries meet—statesmen who are able to commit their countries not only in the area of exchange rates, exchange control, and monetary policy but also in that of commercial and general economic policy. The executive board of the Fund on the other hand is large; it consists of men who are not directly in command in their own countries and who are not empowered to negotiate on anything outside the immediate concern of the Fund (such as commercial policy). Moreover, EPU was lucky in that its first two large debtors, Germany and the Netherlands, pursued liberal policies, put their financial house in order, jammed on the monetary brakes, and so quickly restored their position. If these countries had shown less courage and discipline, if they had procrastinated and delayed remedial action, they probably would have wrecked EPU in its first year.

If the preceding analysis is correct, it follows that the indiscriminate extension of EPU would be undesirable or even impossible. For example, the inclusion of Latin-American countries which has been under consideration might easily ruin the Union, because these countries have not shown sufficient financial and monetary self-discipline. The possibility of intimate and quick consultation at the highest level which undoubtedly contributed greatly to the success of EPU would be lost and it can hardly be expected that the mere introduction of outsiders into the European payments club would bring about a sufficient change in their conduct and policies.

What are the lessons of all that for IMF? What can be learned for

the purpose of operating a global, nondiscriminatory payments system?

EPU high lights, it seems to me, what has been said before: If the Fund is to fulfill its function, it must adopt a tougher attitude with respect to internal monetary and fiscal policies of its members. Since it is not in a position to do that on a global scale, since it has no stick and no sufficiently attractive carrot to coerce or induce recalcitrant members to adopt reasonable policies of internal and external equilibrium, it should not waste its resources on hopeless cases but should concentrate its efforts and energies on those countries which are near convertibility and which have shown that they are willing and able to keep their finances in order and to avoid inflation. The policy might be called the "strong currency approach" because efforts are concentrated on relatively strong (hard) currencies which are near convertibility.

This approach is promising, however, only if a sizable group of countries participates. Such a group does not exist now and is not likely to come into existence in the immediate future, although in my opinion the objective (although perhaps not the political and psychological conditions) exists to create it within a comparatively short period of time—say a year or a year and a half.

The sterling area, Germany, Holland, Belgium, Denmark, Japan, together with the, at present, convertible currencies countries—U.S.A., Canada, Mexico, etc.—should form a strong currency bloc which might soon be joined by France and others. Once a promising beginning has been made, it may be hoped that it will be possible to strengthen the financial resources of the Fund and increase international liquidity by some method or other.



## DISCUSSION

**J. HERBERT FURTH:** My discussion of Mr. Brown's paper would be more interesting if my views differed radically from his own. Unfortunately, they do not. My comments will therefore be restricted to a problem with which Mr. Brown has not dealt extensively: the transition from what Mr. Brown has called monetary convertibility to full convertibility; i.e., to the abolition of direct trade controls as well as of exchange controls.

Many key currencies—and in the first instance the pound sterling—have made some progress toward monetary convertibility. I certainly should welcome complete restoration even of that limited form of convertibility, but I should not want to overrate its importance. In Washington language, monetary convertibility is "a step in the right direction"; but this step would be futile if it led to complacency rather than to further progress.

Those of us who favor the restoration of freedom in international economic transactions do so because we believe that direct controls, be they trade or exchange controls, distort the pattern of international economic activity. We believe that every nation could increase the volume of its production and consumption if it were permitted to buy in the cheapest and to sell in the most expensive market. Abolition of controls, in order to fulfill its purpose, must therefore produce extensive changes in the direction and composition of exports and imports and thus a reshuffling of domestic industries. No effective move in the direction of greater freedom could avoid hurting some sectors of trade and industry and no effective move could therefore be simple and painless.

The concept of the so-called "dollar shortage" itself is primarily a short-hand expression for the fact that under present patterns of production and trade in the nondollar world expenditures on dollar goods give on the margin greater satisfaction than expenditures on nondollar goods. The elimination of the dollar shortage requires, therefore, changes in those patterns that will equalize the satisfaction provided by marginal expenditures on dollar and nondollar goods and thus make possible the maximization of total satisfaction. The fear that the dollar shortage might become permanent is basically the fear that these changes would be so difficult and painful in the short run that the authorities would find it politically impossible to take the necessary measures.

Any country can declare its currency convertible in the purely "monetary" sense if it strictly controls international trade transactions that would give rise to a large demand for foreign exchange. The problems connected with the transition to convertibility will become serious only when the country is faced with a rise in the volume of international trade.

The first of these problems stems from the fact that in countries with inconvertible currencies the prices of internationally traded commodities are usually somewhat higher, at existing exchange rates, than in countries with

convertible currencies. Despite these price differences, an inconvertible country may have achieved external balance because its trade partners are willing to concede somewhat higher prices for imports for which they do not have to pay in gold or dollars. If such a country switches from inconvertibility to convertibility, it is likely to be threatened by an increase in imports and a decrease in exports, which might destroy its external balance.

In order to avoid that danger without further controls, the country must adjust its price-cost relations to the international level either by lowering its domestic prices and wages or by devaluing its currency. Both methods are painful and dangerous and can be successful only if the country adopts vigorous transitional measures so as to avoid a deflationary spiral in the case of price-cost reductions and an inflationary spiral in the case of devaluation. The country might therefore be tempted to retain its external balance by tightening its trade controls the moment it relaxes its exchange controls. In so doing it would, however, eliminate the incentive to change its industrial and commercial pattern, from which alone it could derive the full benefits of convertibility.

It is impossible to state what degree of trade controls is exactly equal in harmfulness to a given degree of exchange controls; but progress toward monetary convertibility would certainly be too dearly bought by any substantial tightening of trade controls.

The second problem stems from "partial disequilibrium"; i.e., the situation in which a country finds itself when it is in over-all external balance but suffers from a deficit in convertible currencies while having a surplus in internationally useless inconvertible currencies. Such a country tends to encourage exports to and discourage imports from convertible currency areas. A country achieving convertibility is not only itself exposed to the danger of partial disequilibrium but also threatened by its trade partners who want to counteract their own partial disequilibrium.

It is in this connection that regional payments arrangements such as the European Payments Union are most useful. By putting member nations with convertible and inconvertible currencies on the same footing, as far as intra-union transactions are concerned, they discourage attempts of the non-convertible member countries to earn dollars by means of an export surplus with the convertible member countries.

Restoration of monetary convertibility of sterling or some major continental European currencies would thus make the EPU more rather than less useful. By putting as much emphasis on full as on monetary convertibility, i.e., on "liberalization" of trade as on abolition of exchange controls, the EPU has shown not only its understanding of the problem but also the possibilities of a solution.

The third problem stems from the fact that no country can expect to be in over-all balance all of the time and must therefore have sufficient reserves to cover temporary deficits. In this connection, too, regional payments unions may play an important role, the more so since increasing trade liberalization also increases the possibilities of temporary disequilibria. The credit quotas provided by the EPU or the credit opportunities of the London money market

available to the members of the sterling area are equivalent to an increase in foreign exchange reserves for fluctuations in intra-union transactions.

Further progress toward the realization of the Bretton Woods objectives requires therefore, in my view, even more daring transitional domestic policies and even more intimate international co-operation, both on the universal and the regional level, than Mr. Brown's paper might have suggested. However, I am convinced that the prize will be worth the effort.

JOHN M. LETICHE: I should like to comment briefly on the searching papers of Professors Gottfried Haberler and Clair Wilcox.

If European economists were confronted with the choice of maintaining inconvertible exchange rates (in a "full employment economy," with violent balance-of-payments crises) or of returning abruptly to convertibility (in an unstable world, with the scrapping of controls), to a good many inconvertibility would appear to be the lesser evil. How is one to reconcile this view with the fundamentally sound position taken by Professor Haberler?

For more than two decades Europe has suffered from an unco-ordinated structure of production, trade, and consumption. The external strains of most European countries vis-à-vis the United States were intensified by the effects of the second World War, through physical destruction and the altered pattern of international indebtedness; through the sustained demand for United States goods; through the more rapid technological progress in the United States; and through the relative inflations in European countries. Widespread distortions in demand and supply of factors, costs, and prices have long prevailed. Inconvertible exchange rates and the panoply of discriminatory trade controls have become embedded in this entire structure. The East-West wall, the revolutions in the Middle and Far East, and the attack on South Korea have further dislocated the pattern of trade. As a result, many economists regard the balance-of-payments crises of the postwar era to have been caused primarily by structural maladjustments. While these crises were connected with Europe's own position, they were also related to the tendency of the United States to have a continuous export surplus, to intermittent fluctuations in terms of trade, and to the need of co-ordinating triangular liberal trade policies with those of investment in underdeveloped areas.

This position, it seems to me, is not inconsistent with Professor Haberler's prognosis. In order to break through the morass of restrictions, a return to convertibility is a primary requisite. The maintenance of convertibility, once achieved, would provide a check to irresponsible fiscal and monetary policies; in addition, it would furnish an effective regulator for the reduction of structural maladjustments. One may fully agree with Professor Haberler's analysis and yet question his assertion that "if exchange rates were set free" and countries kept their internal money wage levels approximately stable, "the balance of payments would quickly equilibrate themselves without sharp shifts in terms of trade."

A wide gap exists between the present perverse operation of the international mechanism of adjustment and a tolerably satisfactory one. It will be

recalled that in the crisis of 1783 the Bank of England for the first time deliberately and successfully met an outflow of gold by a contraction of credit. And as late as 1839, prices rose while treasure declined—a factor clearly indicating that a mechanism of adjustment was wanting. The Bank Act of 1844 was intended, among other things, to enforce legally such a mechanism in the British domestic market. At present, a mechanism of adjustment is again lacking. The existence of a mass of sterling balances within the sterling area has enabled countries to pursue inflationary policies in the face of external current deficits, which have been met by drawing down old sterling balances. On the other hand, creditor countries in the EPU have been unable to treat their export surplus as a primary or even a secondary foreign exchange reserve. Belgium, for example, has actually regarded its potential liabilities to extend credit to EPU as a "mortgage" on its gold reserves.

The EPU, as Professor Haberler states, has rendered useful service in establishing a relatively automatic payments system whereby each member country can settle its accounts with all the other members taken together. But if compared with general convertibility, such limited monetary arrangements are inherently discriminatory. They tend to deteriorate the quality of international trade and hence to reduce the potential level of aggregate real income. The attempts to forecast trade balances between member countries and the Union have not been successful. The consequent periodic need to impose new quantitative restrictions, though essential at time of emergency, has revealed that they do not act nearly so rapidly as is commonly supposed. The sudden changes in restrictions add immeasurably to the uncertainty of trade. When they do improve the balance-of-payments position of a member country, it is usually at the expense of other members, and the controls are apt to be retained and camouflaged for purposes of surreptitious protectionism. The recriminations and retaliations that follow are notorious.

The greatest evil of limited monetary arrangements is that they engender political rivalry between the different "blocs," cause contention among their participants, and create ill will toward "third countries." I am therefore strongly in accord with Professor Haberler's conclusion: the restoration of convertibility of the EPU member currencies and of sterling is indispensable for attaining reasonable "liberalization" of trade and for closing the "dollar gap" in the long run. These objectives must be approached gradually, however, for they are multinational objectives requiring multinational solution in a garrisoned world.

General convertibility cannot be restored and maintained unless international liquidity outside America is increased and nations develop fiscal and monetary policies which are compatible with the operation of an international mechanism of adjustment. The decline in international liquidity may be illustrated by the fact that world imports increased threefold between 1938 and 1951, whereas gold holdings of international institutions, central banks, treasuries, and other governmental institutions increased by only one-half. European imports increased during the same period by more than 250 per cent; European official gold holdings decreased by about 40 per cent. Europe's

general trade deficit was approximately 30 per cent of its gold holdings in 1938 as compared with average trade deficits of 75 per cent of its gold holdings during the period 1950-52. The trade deficit of the United Kingdom amounted to about 65 per cent of its gold holdings in 1938, and 115 per cent of its gold and foreign exchange reserves during the period 1950-52. This decline in reserves outside America is, for the most part, a result rather than a cause of fundamental maladjustments. In effect, large reserves of gold are not required when an international mechanism works satisfactorily. But under present conditions European countries must have larger reserves in order to give them a greater degree of flexibility with respect to the timing and volume of their foreign purchases. This greater freedom would permit an increase in the transactions liquidity function of international means of payment—an increase which cannot be enduringly achieved by superficial, single-effect measures. Effective national monetary and fiscal policies must accompany the undertaking of multinational reserve and stabilization operations. The same factors which would ensure the convertibility of local currencies would enforce the safety of reserves. Professor Haberler rightly emphasizes that the Fund will have to concern itself more intensely with the internal economic and financial policies of the member countries. Whether "the Fund ought to be able to make not only a once-for-all adjustment in exchange rates but also the introduction of freely fluctuating rates, at least for a while, a condition of financial assistance" is another matter.

Because freely fluctuating exchange rates are a powerful vehicle of speculation, it seems to me that the Fund ought not to impose their use. Perhaps consideration should be given to altering the Fund's rules with respect to the range of permissible fluctuations of the par values of currencies, say from 2 per cent to 5 per cent. Under propitious circumstances this could have a favorable influence on the flow of international short-term capital and hence check small disturbances in balances of payments.

Concerning internal finance, the experience in 1951 of Western Germany, the Netherlands, and Denmark suggests that, in an expanding world economy, the control over the availability of loanable funds is the least discriminatory way in which deficit countries can effectively improve their external positions. Since the requirements of international equilibrium relate to relative rather than to absolute movements in incomes, deficit countries are able in times of inflation to improve their balances of payments by relatively slowing down the rate of their expansions. As regards creditor countries, the requirements of international equilibrium imply that export surpluses should at least not hinder these countries from maintaining high levels of activity at stable prices. If, by reason of changes in demand or in relative productivity, the resources of creditor countries come to have a higher relative value, then this should be reflected in increased money incomes. Generally, the experience of the postwar period seems to indicate that after exchange rates have been adjusted to appropriate levels, the maintenance of reasonable stability in the stock of money per unit of output is not an unsatisfactory financial guide for external balance under conditions of full employment.



Only by the development of some such rules and the observance of them by most nations concerned can a properly functioning international mechanism of adjustment be re-established. The most promising approach appears to be along the lines suggested by Professor Haberler; namely, the establishment of a nucleus of convertible currencies and, on the basis of this experience, gradually to help countries move toward general convertibility. Wherever necessary, foreign reserves should be increased through monetary stabilization loans or through the "stand-by drawing account" device of the Fund whereby countries may obtain assistance on an "if it is needed" basis. These measures would not only help to remove the financial maladjustments which have been responsible for external disequilibrium, but the problem of dealing with the structural maladjustments would be immensely simplified. It is in this respect that the paper of Professor Haberler is complementary to that of Professor Wilcox.

I am entirely sympathetic with the economic objectives formulated by Professor Wilcox. Many structural maladjustments would be swept away if the United States would further reduce its barriers to imports. Few measures could so well serve our own national needs and those of Europe than unilateral reductions of many United States tariffs. Professor Wilcox, however, appears to overstate his case when he says: "Removal of barriers to imports is essential to prosperity; it is even more essential to national security." Tariff barriers may hinder—they do not prevent—the attainment of prosperity. They affect the quality but not the quantity of resource-use. Theoretically, tariffs have no effect on the balance of payments under competitive conditions. Practically, they often protect a monopoly-price-ridden structure. Under these circumstances, though the positive results of tariff reductions on balances of payments are unquestionable, the extent of their influence is uncertain. These criticisms are minor when compared with the psychological and political effects that United States tariff reductions would have on the world economy.

Proposals with respect to currencies, trade, investments, military procurement, and aid should certainly be co-ordinated. On the purely technical economic plane, a nonpolitical group of experts could prepare future alternative budgets concerning our external economic transactions. These budgets could then be used in formulating consistent policy. Professor Wilcox has had much practical experience in the administrative field and his views as to how the related parts of the common program should be implemented carry weight. But one must question the advisability of returning the tariff to Congress, because this may lead to log-rolling and crippling amendments to present legislation. Moreover, there are many instances in which the bargaining power of the United States commercial and economic position can be used advantageously.

As Professor Wilcox has shown, United States tariffs have been substantially reduced since the second World War. It is most important that there be no changes in commercial policy which would make it harder for other countries to sell in the American market. It cannot be overemphasized that our political efforts to unite the non-Communist world—and to integrate

Western Germany and Japan into its framework—will be seriously hindered unless our economic practices operate in the same direction. The attainment of convertibility and the reduction of barriers to trade constitute an inseparable feature of this endeavor.

WILLARD L. THORP: The next six months will be a critical period in connection with foreign economic policy in the United States. The fact that the Reciprocal Trade Agreements Act has been on the books for eighteen years and that under it there have been substantial tariff reductions is not as significant an indication of a firmly established American policy for lowering trade barriers as might appear at first. The program started during the depression when the American market was not particularly attractive. Then came the war period when shipping was completely interrupted. Finally, the postwar period has been largely dominated by shortages and foreign suppliers have been building up their production and meeting domestic demands. Only within the last year or two has the policy really had any appreciable effect and the rising tide of demands for protection would indicate that the principles to be found in every elementary economics textbook are not yet fully accepted. It is also worthy of note that there were many organizations which strongly supported the program in the days when this was their one outlet in the field of international relations. Today their support is needed by many different international endeavors and the economic field must compete for their time and energy.

On the other side are the facts of the case which certainly bring economists into an extraordinary amount of agreement along with exporters, foreign investors, taxpayers, and consumers so far as they are articulate. To be sure there are disagreements with regard to emphasis, timing, and gimmicks, but the elements of a liberal foreign economic policy which the speakers have outlined today seem very clear.

The importance of economic factors in the international world are not always clearly recognized. For example, the North Atlantic Treaty began as a political notion which was then extended into the military field under the aegis of the NATO. Only after substantial military planning had been done did the limitations imposed by economic capabilities rear their ugly head. Today it is clear that our economic policy will have a great deal to do with the progress made under the NATO. Similarly the economic situation of Japan will in the long run define whether or not the fine political objectives of the Japanese Treaty will have real meaning.

It is therefore tremendously important for purposes far beyond the field of economics that we adopt wise foreign economic policies. It is also important that these be as definitive as possible. The solution of world disequilibrium requires substantial shifts in the structure of production and trade about the world. So far as increasing earnings in the dollar market is concerned, it may also require considerable expenditures in developing the channels and procedures for effective distribution. A few instances of uncertainty and inconsistency as to our commercial policy can be devastating, such as our sudden

restriction on imports of Danish cheese after Denmark had made great efforts and what for her was a substantial investment in the effort to earn more dollars in the United States. The failure of the Congress to pass the customs simplification bill has also been interpreted as indicating our unwillingness to ease the difficulties faced by the importer.

In this situation I cannot help but feel that the economist must accept a share of responsibility. It is not enough in our world to assume that the truth will prevail by some process of osmosis. We know that action will be taken of some sort or other, and I feel that each one of us must do what he can as a citizen and as an economist to help see that the policies which are followed represent the wisest balance between our national and our international interest.

# UNDERDEVELOPED COUNTRIES: THE THEORY AND PRACTICE OF TECHNICAL ASSISTANCE

## FACTORS IN THE ECONOMIC DEVELOPMENT OF GUATEMALA<sup>1</sup>

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### I

Any analysis of the natural resources of Guatemala at once suggests an underdeveloped economy. Fertile volcanic soils, extensive hardwood forests, promising mineral deposits, and obvious hydroelectric potential may readily be counted as blessings to be turned to good economic account. Yet over a large part of the country this happy process has been retarded by a mountainous topography that has hampered transportation and communication, perpetuated the cultural isolation of regions, and created such obstacles to economic development that potentially productive areas have remained virtually inaccessible. Malaria and other debilitating diseases have prevented effective utilization of the country's most promising agricultural area, which lies in the Pacific coastal plain. As a result, settlement is concentrated in the central and western highlands. There a large Indian population cultivates marginal land on a subsistence basis while more productive agricultural areas frequently lack labor.

Approximately two out of the three million people in the country are of pure Indian blood, the rest being principally of mixed Indian and Spanish descent, known as *Ladinos*. The distribution of income is very unequal. The annual per capita income of the Guatemalan Indian has recently been estimated at 70 quetzales (1 quetzal equals 1 U.S. dollar) and that of the *Ladino* population at 246 quetzales. The Indian way of life continues to be highly resistant to outside influence and allows only limited participation in the money economy and political life of the country. The Indians, apparently satisfied with a ration of corn—and perhaps of *aguardiente*—the first, at least, obtain-

<sup>1</sup>The author has taken the liberty, as Chief of the International Bank Mission to Guatemala in 1950, of drawing freely on the report of that Mission for much of his basic data. See *The Economic Development of Guatemala: Report of a Mission Sponsored by the International Bank for Reconstruction and Development in Collaboration with the Government of Guatemala* (Washington, 1951), pp. xviii, 305.

able from their subsistence farms, contribute little to the economic life of the country except to provide a somewhat reluctant labor force to meet the harvest needs of the large coffee plantations. The economic and social development of the country must therefore depend on the initiative of the *Ladino* third of the population, supplemented by the participation of foreigners.

Even the per capita income figures cited above represent some improvement, particularly for the *Ladinos*, in the last few years. There are grounds for believing that the revolution of 1944, which brought to power the rough, Latin-American equivalent of a socialist government, may have marked the beginning of a new epoch in the development of Guatemala, although reservations respecting certain innovations will appear later in this paper. Under a new constitution adopted in 1945, the first constitutional change of presidents took place in March, 1951, after a relatively peaceful election. In conformity with the social provisions of the new constitution, the government began as early as 1946 an active program to improve the lot of the Guatemalan worker. The Institute of Social Security was established, labor unions began to organize, and in 1947 a Labor Code provided for collective bargaining, settlement of labor disputes in labor courts, and compulsory arbitration of disputes involving public services. Finally, economic problems received attention with reorganization of the Central Bank in 1946 and the creation of an Institute for the Development of Production (Instituto de Fomento de la Produccion, commonly referred to as INFOP) in 1948. The Institute was designed to tackle the concrete task of increasing agricultural and industrial production. Given a substantial measure of administrative autonomy, financial independence, and comparative freedom from political interference, it acts both as a development bank and as an agency for planning and for action. It has already demonstrated its usefulness in many fields.

## II

Guatemala possesses the essential prerequisites for a diversified and abundant agriculture in rich soils, a wide variety of climates resulting from the range of altitudes, and easily accessible foreign markets. Agriculture now engages 75 per cent of the labor force, creates about 60 per cent of the gross national product, and accounts for 95 per cent of the value of the country's exports. In the last decade, however, increases in agricultural output have barely kept pace with population growth, although it seems clear that any material improvement in the standard of living in the near future must come about mainly through increased agricultural production.



Although commonly regarded as one of the banana republics in the empire of the United Fruit Company, coffee accounts for approximately three-quarters of the total value of Guatemalan exports. Guatemala is actually in third place in world coffee production, ranking only after Brazil and Colombia. Bananas, whose share in the late thirties amounted to some 27 per cent, now represent less than half that figure. Other exports include abaca, chicle, essential oils, minerals, and timber. Guatemala's foreign trade is the largest of any of the six Central American countries, ordinarily accounting for a third of the value of their combined exports and a fourth of their total exports.

Coffee, like bananas, is chiefly a large-plantation product. There are upwards of 12,000 coffee producers but four-fifths of the crop comes from 1,500 *fincas* or farms employing a total labor force of more than 400,000. The Fincas Nacionales, comprising about 130 of the largest of these coffee farms and producing about 25 per cent of the total coffee crop, are state-owned, having been acquired from German aliens during wartime. Banana production tends to be concentrated in and around the large plantation of the United Fruit Company at Tiquisate on the Pacific Coast. This plantation, although highly mechanized, employs approximately 9,000 Guatemalans.

Part of the explanation for the present inadequacies of agricultural production is to be found in the cultural isolation of the Indians, which contributes to the survival of antiquated methods of cereal cultivation practiced of necessity on impoverished mountain slopes, since the choicest valley and coastal lands have been held since early Spanish colonial times by a small number of landlords living in national or departmental capitals. Yet the commercial agriculture of the *Ladino* population, reflecting the concern of absentee landlords with quick returns, is often almost equally unprogressive and wasteful. The introduction of improved methods presents, however, vastly less difficulty in the non-Indian sector of the rural economy where, even in the short run, technical obstacles to agricultural development can probably be overcome. In the longer run, the poverty of Indian highland agriculture remains the fundamental barrier to agricultural progress and to the economic growth of the whole country.

The International Bank Mission to Guatemala in 1950 concluded that the two most urgent short-run requirements were: an all-out effort to increase coffee production and a similar drive to achieve a rapid and substantial increase in basic foodstuffs such as corn, beans, rice, and meat. In theory, at least, both of these requirements would appear to be attainable, the first in the areas of present production, the second through opening up the Pacific Coast to mechanized agriculture. Such a program would stress additional research with a view to pro-

ducing improved plant varieties, seed, and livestock breeds;<sup>2</sup> extension work to make the results of such research available as widely as possible; soil management and conservation; the establishment of additional mechanization centers with training facilities for machinery operators; increased agricultural credit; and improved storage, processing, and marketing facilities.

The entire investment program prepared by the Mission is clearly dependent upon increased returns from coffee. The Mission argued that, with the aid of well-directed research and extension work, Guatemala could increase her coffee exports from presently producing farms by 50 per cent in the next ten years. Certainly the state-owned coffee farms could, under reorganized management and with improved production techniques, occupy a strategic position in realizing both coffee production and investment goals. Such emphasis on coffee need not involve abandonment of the quest for a more broadly based agriculture and again the state-owned farms present an opportunity to stimulate both experimentation in and increased production of corn, beans, rice, sugar, cacao, cotton, hard fibers, and perhaps even rubber and vegetable oils.

The larger, long-run problem of integrating the population into a single economy calls for a carefully co-ordinated program, to be undertaken simultaneously with the short-run program, to improve education, health and nutrition as well as methods of production, to find new occupations for the Indian population of the highlands, and to prepare its partial resettlement on better lands. All this would of necessity be a slow process in which perhaps the main emphasis would be on the work of the teacher, the sociologist, and the social psychologist. Partial alleviation of the depressed living standards resulting from overpopulation in the highlands might be secured through a gradual shift in emphasis from the growing of corn to livestock and dairy products, truck gardening and fruit production, and indigenous crafts, supplemented at a later stage with the cheap hydroelectric power which might be generated by small manufacturing plants. Resettlement presents greater economic as well as sociological problems but also greater possibilities. Development of the Pacific Coast and the lower piedmont, which currently offer the most satisfactory prospects for this purpose, is dependent on the successful execution of large-scale sanitation and health measures, together with substantial capital investment to acquire and clear land and to provide essential public services. A few years ago, competent specialists of the Pan-American Sanitary

<sup>2</sup> Effective agricultural research is now being conducted by the Instituto Agropecuario Nacional in association with INFOP under a co-operative agreement between the governments of Guatemala and the United States.

Bureau estimated expenditures necessary for permanent sanitation of this region at approximately 30 million quetzales. Of this amount, safe water supply and sewage would account for 27 million quetzales. Spreading of DDT for temporary malaria control would cost 400 thousand quetzales per year.

### III

In the nonagricultural sector of the Guatemalan economy, mining, particularly of lead and zinc, shows most promise of immediate development. Adequately financed by American interests and with assured markets, the chief handicaps to mineral development are transportation, shortages of skilled technicians, and the inadequacy of basic information on mineral resources.

Industry occupies a relatively unimportant place in the economy today, and it seems unlikely that heavy industry will be developed on any appreciable scale in the immediate future. Yet with increased generation of hydroelectric power to fill the gap caused by the present absence of coal and petroleum in the country, development based largely on the processing of agricultural products could result in a substantial increase in the national income. The present backward state of agriculture is, however, undoubtedly a handicap to industrial progress. Domestic agriculture contributes only slightly over half of the total materials required by Guatemalan industry. A disproportionate reliance upon imported materials, combined with high prices for many domestic supplies, results in high costs for all industrial raw materials.

The inadequacy of the domestic market is one of the greatest impediments to the development of industry. Enlargement is possible through a rise in real wages, through better transportation (which would reduce domestic raw material costs), and through elimination of excessive profit margins. Co-ordination of industrial development among Central American countries might create markets large enough to support certain new industries of optimum size.

The paralyzing effects of high transport costs are everywhere apparent. Yet, as indicated at the beginning of this paper, provision of an adequate transportation system has been made difficult by physical conditions and topography, the low levels of public investment and private income, and shortages of professional personnel and skilled labor. There is also evidence of a lack of planning. Consequently, along with the improvement of agriculture, the survey Mission put primary emphasis on the improvement of transportation facilities as prerequisites to diversification of the economy and expansion of its manufacturing industries. As a first step in the transportation field, the Mission proposed a basic network of highways serving important industrial and agricultural areas, with specific recommendations as to policy and a

scale of priorities for work projects. The domestic communications service provided by government-owned telephone, telegraph, and radio systems also leaves much to be desired. Principal defects of these services are obsolete equipment, poor construction, and weak organization.

Traditional price policies which look to high profit margins at the expense of volume, shortages of capital and credit, and low labor productivity further conspire to inhibit industrial expansion. In terms of technology, there is much room for improvement in efficiency through modernization of methods and machinery. Many establishments are not yet beyond the handicraft stage, although others, such as the cement plant and the newest cotton textile mills, compare favorably with industrial installations of more advanced countries. Since specialized educational facilities are inadequate to provide a domestic supply of trained personnel, it would seem reasonable to assume that at the highest levels of technology the economy would have to rely heavily upon foreign technical skill and training centers for some time to come.

The low productivity of labor, stemming largely out of low levels of health, nutrition, and elementary education, is a further persistent barrier to industrial development. The present life expectancy of about thirty-six years suggests that public health is a formidable national problem in its own right. With nearly two-thirds of the population over six years of age illiterate and with primary education, when available and despite the progress of the last few years, usually limited to three years, creation of the necessary class of skilled workers and supervisors will of necessity be slow. Short-run factors currently increasing labor costs are resistance to modernization and mechanization and legal provisions which make it extremely difficult to release unsatisfactory workers.

#### IV

The financing of an economic development program could conceivably be the most manageable part of the problem of increasing national productivity and raising the standard of living in Guatemala. Total capital formation can be increased through savings from both public and private funds. Export prices are highly satisfactory and the government itself owns many of the most productive coffee *fincas*, from which with better management it could derive substantially increased revenues. In addition, the tax system offers very substantial opportunities for increases in yields by improving present tax administration, increasing tax rates, and tapping new sources.

Other domestic sources of investment capital will become available more slowly. Nevertheless, private savings, now small, can be increased by promotion of savings campaigns such as the one recently initiated

by the Development Institute. This campaign has been extended within the last year to tap the large pay rolls of the United Fruit Company and its subsidiaries at Tiquisate.

Private capital formation has never been large and has been accomplished mainly through the initiative of a relatively small number of enterprising individuals rather than through the public marketing of securities or the investment of reserves by large companies. In new and locally unexplored industrial fields, mobilization of sufficient capital funds has always been difficult because of the inherent conservatism of Guatemalan capitalists. But there have been other obstacles. Political instability and implied threats to property rights have, over a long period, tended to create a feeling of insecurity. In more recent years, labor-management disputes appear to have been settled almost invariably with a bias in favor of the worker and this has discouraged prospective investors. The relatively large amounts of private funds held outside the country at the present time reflect the strained relations between successive governments and certain elements in the business community, resulting in periodic flights of capital, a general lack of confidence, and an unfavorable climate for private investment. The government can, if it wishes, take the necessary steps to begin correction of this situation. As indicated above, Guatemala still lacks many of the basic conditions in the form of social capital necessary for the large-scale business enterprise; e.g., transport facilities, power, health, and education. These deficiencies can be remedied only in time.

Development of a Guatemalan market for government securities has been handicapped by the same lack of confidence that offers a stumbling block to private investment. This has been further aggravated by the treatment received by creditors of the state in the past and by the attractive returns from investment in mortgages, trade, or speculation.

Foreign capital has undoubtedly made a significant contribution to the development of the Guatemalan economy in the last two generations, but there are some debit entries in this ledger the effects of which are painfully evident at the present time. The three most important foreign corporations are the United Fruit Company with its virtual monopoly of the banana export trade; the International Railways of Central America with its monopoly of rail transport and under control of United Fruit, its principal user; and the Empresa Electrica de Guatemala, a subsidiary of American and Foreign Power, which supplies more than four-fifths of the electric power produced in the country. The monopoly possessed by the United Fruit Company



and the International Railways of Central America of both rail transportation and of pier facilities at the country's principal port, to which the rest of the Republic has had no access by road, inevitably gives rise to charges of discrimination of all kinds, particularly in allocation of pier space and of excessive rates. The character of the present contract with the International Railways of Central America, concluded in 1923 and running until the year 2009, does not appear fundamentally different from that of the first "concession" granted by the administration of General Barrios as early as 1877. The original contract with the United Fruit Company was concluded in 1901. In view of anticolonial trends in the world today, these dates by themselves suggest the outmoded character of these agreements and the necessity of renegotiation to fit changed economic and political conditions. Both sides assume unrealistic positions: the foreign companies resist change and the government harasses them by discriminatory labor and social legislation. The resulting stalemate discourages investment of further private foreign capital.

Guatemala's present gold and foreign exchange reserves and balance-of-payments position, combined with favorable export prospects, would seem to indicate, given a firm budgetary and monetary policy, a reasonably good international credit position. The "optimum" six-year public investment program recommended by the International Bank Mission represented a 60 per cent increase over the 1948-49 level of investment and was based on the physical capacity of the economy to absorb investment, domestic or foreign. It assumed that external borrowing to the extent of some 20 million quetzales should be well within the country's capacity to repay. But perhaps the most encouraging feature of estimates behind the optimum program is the calculation that some 41.5 million quetzales of the required total of approximately 60 million quetzales should become available from internal sources for development purposes during the six-year period.

In the proposed investment program more than one-third of the expenditures would go into highway construction, most of the remainder for agricultural improvement, a health and sanitation campaign, and power development, with relatively small sums allocated for domestic communications and irrigation. In case the most favorable conditions were not realized, the Mission prepared two alternative investment programs: the one assuming foreign loans of 14 million quetzales and the other no borrowing of any kind. If no financial aid were obtainable, however, both the highway and power construction programs as well as the health and sanitation campaigns would have to be sharply reduced and the entire development program thus seriously curtailed.

## V

The government of Guatemala had, by the end of 1951, endorsed the Mission's optimum investment program and announced its intention to implement most of the Mission's recommendations, including specifically the fundamental proposals for the improvement of agriculture and the building of a modern highway system. Construction of the urgently needed highway link with the Atlantic Coast was begun and contracts were let for 3.6 million quetzales of new road construction machinery from abroad. To encourage mechanization in agriculture, farm machinery was exempted from all import duties; to stimulate increased corn production, price controls and export restrictions on corn were abolished. A national commission on tax reform was established, the coffee tax increased, and a personal income and capital gains tax introduced. More recently the government has proposed the financing of a number of its development projects through a 20 million quetzal bond issue guaranteed by a series of new taxes and higher customs and excise duties, especially on luxuries and alcoholic beverages. Various commissions—on reorganization of the state-owned farms, on hydroelectric power development, on port facilities, etc.—have been set up.

All this may suggest that a brave new world is well on the way in Guatemala. It would be a mistake, however, to neglect the fact that nationalism, inflamed by the arrogance of North American capitalism and fanned by a well-entrenched local communist movement, is probably the most important factor in the economic development of the country today. Much of the apparent progress chronicled above may have been made only on paper; political obstacles to the effective co-operation of foreign capital and the most efficient use of the economy's resources continue to be real enough. Thus the last few months have witnessed a bitter dispute with foreign insurance companies over the government's drastic retroactive legislation requiring investment in quetzal bonds. Failure to come to any satisfactory arrangement with the railway company on pier facilities is indicated in recent government proposals to spend 5 million quetzales on a new Atlantic port. In the long war of attrition with the United Fruit Company, nothing more than an uneasy truce has been reached under which the Company will continue operations and rehabilitate one of its plantations. The prolonged controversy arising out of Guatemalan territorial claims to British Honduras (Belize) sharply reduces the possibility of successful exploitation of the hardwood resources of the Peten in the immediate future. National administration of chicle exports, hitherto the most important forest crop of the Peten, appears to have almost priced this product out of the market. Finally, appeals to

national pride (the "hewers of wood and drawers of water" argument so familiar to Canadians two generations ago) pretty well assure continuation and probably extension of the paraphernalia of import prohibitions, restrictions, and tariffs, which, by affording a degree of protection frequently sufficient to eliminate competition, have reduced incentives to improve efficiency in many of the secondary industries.

Political pressures more suggestive of a "green" revolution to get rid of continuing feudal conditions than a "red" one may be seen in the Agrarian Reform Law passed some six months ago: its reported first objective is "to develop the capitalistic economy of rural dwellers and the capitalistic economy of agriculture in general."<sup>3</sup> The Bank Mission had suggested the possibility of dividing some of the large state-owned farms into smaller units on an experimental basis and of the state acquiring uncultivated Pacific Coast lands as part of a carefully planned program of land reform and increased production. The present highly complex measure goes far beyond these proposals, although the nature and effects of any redistribution of lands that may take place under the new legislation are not apparent yet.

The nature of the obstacles to any comprehensive development program for the Guatemalan economy clearly requires the state to assume a major role in the process. In this connection, the record of the government-owned air-transport system, Aviateca, combining low rates, efficient operation, and a remarkable safety history, is encouraging. Nevertheless, there is a very real danger that limited financial resources may be dissipated unless a fair degree of co-ordination can be secured. Thus current proposals of the government, calling for creation of a bank of rural credit when the Development Institute, among other government agencies, is already operating in this field, are scarcely reassuring. Ambitious schemes of "land reform" may prove costly and disappointing, while Canadian and other experience indicates terrifying possibilities for the waste of public funds in the rapid expansion of agricultural credit and ill-conceived irrigation projects.

In conclusion, one or two final points may be noted. It would doubtless be a vast oversimplification to assume that all underdeveloped countries fall into the same pattern or that all their problems could be solved by massive injections of capital and the application of mature techniques. The role of technical assistance is more modest and circumscribed. North American capital and technology are not the complete answer. Even if the capital resources, technological skills, and entre-

<sup>3</sup> See *Journal of Commerce*, June 19, 1952. The agricultural census of 1950 had revealed that 76 per cent of the landholders occupied only 10 per cent of the cultivated land while 2.2 per cent of the owners held over 70 per cent.

preneurial talent were forthcoming, rapid industrialization would in most instances probably create more problems than it solved. Social factors are extremely complex.<sup>4</sup> In any event, in countries like Guatemala there are obvious limits to industrial development in the measurable future; agricultural improvement holds infinitely more promise and would appear more feasible. If we could be reasonably certain that a population problem would not emerge to absorb the gains from increased productivity, such improvement might be reflected in a significant advance in standards of living.

<sup>4</sup> See Elizabeth E. Hoyt, "Tiquisate: A Call for a Science of Human Affairs," *Scientific Monthly*, February, 1951, pp. 114-119, and "Want Development in Undeveloped Areas," *Journal of Political Economy*, June, 1951, pp. 194-202.

## FACTORS IN THE ECONOMIC DEVELOPMENT OF CEYLON

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### I

The central problem now emerging in Ceylon, toward whose solution any developmental program must be directed, may be put in Malthusian terms as a race between population and productivity. Until recently this was not so. Although population has grown steadily over the past half century and more, so have the means of providing for its sustenance. International specialization has been mainly responsible. Steadily rising exports of tea, rubber, and coconut products have made possible growing imports of rice and other foodstuffs in the face of lagging domestic production of these necessities, until in recent years some 60 per cent of the island's food requirements have been obtained in this manner.

Now, chiefly as a result of the advance of science along two fronts, the situation has undergone drastic change. During and since the war, the use of DDT has so reduced the incidence of malaria as to bring down the death rate by nearly half. Accordingly, the annual rate of increase of population has risen sharply; instead of the prewar figure of about 1.7 per cent, since the war it has amounted to 2.8 per cent. Changes in the age composition of the population may be expected to moderate this figure somewhat; so that for the foreseeable future an annual increase of population of about 2.4 per cent must be reckoned with.

On the side of exports, the development of synthetic rubber now threatens to bring to a halt further expansion of this source of overseas income, while tea production is approaching the limit set by available land, and aging palm groves combine with growing home consumption to threaten declining coconut exports.

The International Bank Mission to Ceylon sees the solution to the divergent trends of food requirements and export prospects principally in augmented production of domestic agriculture. This is to be achieved partly by colonization of the underutilized portions of the island and partly by increased productivity on the food-producing lands already under cultivation. The program is, however, far more than purely agricultural. It fully recognizes that economic development



is a process of "balanced growth," and includes substantial provisions for improvement of transportation, the expansion of electric power, and more adequate facilities for health and education, as well as specific measures to stimulate industrial growth.

Whether the recommended program is adequate to halt a possible decline in the standard of living, or better yet, to raise standards somewhat, is debatable. Tailored to the resources likely to be available to the country, it calls for annual investment of some Rs. 550 million per annum, or about 11 to 12 per cent of gross national product. Assuming a moderately optimistic capital-output ratio of four to one, annual increments to income should rise gradually from Rs. 125 to 150 million a year. Since merely to provide for the growth of population will require an annual increase of about Rs. 100 million, this means, in the words of the report itself, that "the margin for waste and inefficiency will be very narrow." For per capita productivity to be raised, not only will there have to be "constant attention to the careful selection of better tools, equipment and methods," but these new methods will have to be widely adopted and the better tools and equipment used with a high degree of effectiveness.

This raises questions which are neither financial, technical, nor even primarily economic, but which are rather predominantly cultural. Assuming that the Mission's report embodies sound judgment as to the availability of finance, the limitations and possibilities dictated by geography, and reasonable prospects of technical aid, the success or failure of its program will largely depend upon whether the modern methods and techniques necessary to raise productivity can be assimilated by the people of Ceylon. For it is their daily productive efforts which must be made more efficient and hence more fruitful, and it is their willingness and ability to adopt better procedures and to use new instruments upon which this outcome will depend. Willingness and ability of a whole people to change its ways is essentially a cultural problem, as Hoselitz has vividly shown. In the case of Ceylon, the crucial questions to be answered are: To what extent is there conflict between Ceylonese values, customs, and institutions and the values and attitudes required by essentially Western techniques? Can indigenous institutions be used to introduce new methods or to adapt these methods to Ceylonese requirements? Does there exist or can there be created in time a corps of leaders in the economic life of the community with the ability and the enthusiasm necessary to elicit co-operation from the rank and file?

Let us approach an answer to these questions by first surveying the changes required and the obstacles interposed in the fields of agriculture and industry. Then we can consider the human and institutional

resources available for effecting change and the provisions suggested for improving them.

## II

In agriculture, progress is hoped for in two main directions. First, continuance and expansion of colonization schemes will place cultivators with inadequate land on newly irrigated plots or on land suitable for dry-farming. But since the area suitable for irrigation comprises only about 600,000 acres, while the extension of dry-farming is limited to areas with reasonably dependable rainfall, this string to the bow is not a complete answer. It is estimated that the combined crop potential of all unused lands will be roughly not more than half of those now producing for domestic consumption. Also, because of limitations of finance, available technical staff, and the need for experimentation and training of colonists for dry-farming, exploitation of this potential cannot be achieved for a good many years.

This means that to increase food production in the near future, considerable reliance must be placed on a second phase of agricultural expansion: improved productivity on lands now being cultivated. The Mission sets as a minimum target for rice from existing paddy land an increase of 10 per cent in yields in the next six years.

Social and cultural obstacles to the success of such an agricultural program are formidable. The Ceylonese peasant is notoriously conservative and guided by tradition; he dislikes change and is not easily moved by economic considerations to alter his customary ways, being far from an "economic man" in the Western sense. Pride in doing a job well for its own sake or a spirit of workmanship is scarcely one of his traits; he is satisfied if he performs according to established routines. In this he is reinforced by the influence of Buddhism—the predominant religion of Ceylon—with its emphasis upon adherence to certain established rules of conduct and its deprecation of worldly desire.

The result of these characteristics may be seen in the failure of proven methods on demonstration farms to be widely copied. Reinforcing the peasant's conservatism and his weak response to economic motivation is a cultural factor which impedes the spread of knowledge about improved methods. He fears the "evil eye" will strike him with disaster if he appears to boast. Hence, unlike the Western farmer who has profited from new techniques, he keeps his good fortune to himself and fails to become an enthusiastic and ever multiplying emissary of progress.

Similarly in the field of health: years of strenuous effort by government health officers to encourage the building of latrines, backed by the provision of free materials, has induced villagers to construct only

a negligible number. In spite of the prevalence of intestinal parasites and unremitting propaganda associating their inroads with his insaniary habits, the villager continues to follow the ways of his ancestors.

These cultural impediments not only obstruct the improvement of yields on land already farmed, but they are likely to be carried over into the newly colonized areas, since these are being peopled by cultivators from the settled regions who have little or no land, so far as possible in groups from single or neighboring villages. Arrangements are being made in the colonized areas, however, for closer supervision of farming operations.

To induce a conservative and comparatively uneconomic-minded peasantry to alter its procedures and to adopt improved methods, better implements, and superior strains of seed is not impossible, as experience in India and elsewhere demonstrates. But to overcome this conservatism and inertia, particularly to do so at a speed consonant with the goals of a development program, requires the presence of a sufficiently numerous, devoted, and energetic "spearhead" group of trained leaders. Moreover, if they are to achieve results consistent with their efforts, they must understand the peasant's outlook, approach him sympathetically, and develop unusual skills of persuasion.

A principal constituent of such a spearhead group in Ceylon is the agricultural extension staff of the Department of Agriculture. It consists of about 150 field officers, assisted by some 330 field demonstrators and food production overseers. Although more numerous, in proportion to the rural population, than county agents in the United States (1 per 11,800 as against 1 per 18,200), they confront a far more difficult task and are too few in number. In the words of the Mission's report:

So far as . . . the dissemination of information is concerned, a shortage of practical agricultural extension staff to demonstrate on the peasant's own plot the efficacy of such improved seed, implements and practices is one of the great handicaps in implementing this very wise policy. . . . The task is large, and officials are well aware of the difficulty in building a staff fully adequate to handle the development program at the desired speed. In the aggregate, professional, technical and applied knowledge still is far below the standard required for a successful assault upon the forces of ignorance and inefficiency that hold back progress. . . .

If the extension staff is too small, it is equally true that its approach is inappropriate. Instead of adopting the method so successfully used in India's Uttar Pradesh, of discovering the peasant's "felt need," of helping him to realize it, and then, having gained his confidence, of persuading him of the benefits of changes in techniques and even in the crops to be raised, the Department's workers operate on a comparatively autocratic principle. As government officials in a society dominated by status, in which government service confers exceptional prestige, they feel superior to the simple cultivator, and establish a working relationship of the all-knowing government official telling the

lazy and ignorant peasant what to do. "Drives" to get people to do this or that are common, regardless of their interests. Contests are sponsored, but since competitive zeal is not a characteristic of the Ceylonese peasant, they evoke little enthusiasm.<sup>1</sup>

Cultural obstacles to change are perhaps pointed up most conspicuously in certain features of the family system, especially in relation to a rather obvious means of moderating the race between population and production; namely, the exercise of control over the rate of population increase. On this, the Mission makes an "earnest plea that Ceylon follow the example of her neighbor, India, in a bold effort to convert her people to the principle and practice of family planning," persuading the individual "to act by propaganda and by making available advice and facilities." It recognizes that this is a policy "calling for great courage and tact," but believes it is one "which can do more to raise the living standards and well-being of the Ceylonese of the future than any other action or influence within the power of the government." In view of the Mission's estimate that population growth in the next decade may be of the order of 2 to 2.5 millions, while potentially available irrigated and dry land "can hardly support more than 1.5 million," this conclusion certainly appears to be well founded.

In Ceylon's family system, however, male dominance is outstanding. The father is unquestioned head of the household; he replaces his wife's father in authority, and to her husband she owes entire allegiance. And to this head of the household, children are an unquestioned asset. All the burdens fall on the mother; the father views his children as an extension of his ego, the source of status in the community, and as possible contributors to enhanced status of his kin through well-arranged marriages. Sons, in particular, add to his stature, and more, are a source of help in his work, of security in his old age. So although most women simply feel helpless in the face of destiny, view large numbers of children with decidedly moderate enthusiasm, and might be won over to control of family size, men welcome numerous progeny. It is the dominant male whose opposition would have to be overcome. Surely this factor poses a serious stumbling block to propaganda, advice, and facilities. As one writer puts the matter, the problem "is not essentially educational, but one of obtaining acceptance of birth limitation in a society tied to large family values"—and tied by the loyalties and interests of the strongest element in the family.<sup>2</sup>

<sup>1</sup> See Murray Straus, "Cultural Factors in the Functioning of Agricultural Extension," to appear in *Rural Sociology*.

<sup>2</sup> Bryce Ryan, "Institutional Factors in Sinhalese Fertility," *Milbank Memorial Fund Quarterly*, October, 1952.

I turn now to the industrial sector. Growth of industry will be comparatively limited in Ceylon, since suitable local raw materials and fuels are few, the potential market is limited, and capital resources are relatively scarce. Yet, in the view of the Mission, well-chosen industrial expansion will be desirable in years to come, especially as the empty lands fill up and new employment opportunities for the growing population have to be found.

### III

In the industrial field as well as the agricultural, at least the immediate limits to growth are more social and cultural than economic. Perhaps most needed for success is an increase in the technical skills that are so important in modern industry as well as in a progressive agriculture. In the words of the report:

In most fields, the rate of development is actually limited less by finances than by lack of local technology at all levels. To carry out the various projects there are not enough research scientists, designing and operating engineers, agricultural or manufacturing specialists, or construction engineers. Equally scarce are technical supervisors, draftsmen, control chemists, field foremen, tractor operators and even skilled workmen. To remedy this must be one of the first tasks.

This shortage of well-distributed technical skills is only partly due to very limited facilities for vocational training. Much of it can be explained by the very history of the island's past development, which has been one of continued agricultural specialization. But there has been only a slow and inadequate response to growing opportunities for the use of industrial and technological skills. For an explanation of this, we must look to the special bias of the educational system, the influence of caste, and the special prestige of government service.

Ceylon's educational system has been, to paraphrase the words of its own Special Committee on Education, excessively uniform, excessively academic, and almost entirely without relation to the practical aspects of life. Arts and crafts have been neglected, opportunities to give instruction a practical bent overlooked, and the curriculum has been dominated by the highly academic requirements of a university entrance examination. Neglect of practical subjects may be partly, but only partly, attributed to the origins of Ceylon's educational system in mission schools patterned on a nineteenth century British model. Doubtless more important is the exceptionally strong prejudice against manual labor, in which caste distinctions against certain manual occupations play an important role.

Not only in its influence upon the school curriculum but also in its character as a determinant of social values has caste impeded the growth of a more adequate supply of skilled workers and of supervisory employees. Although not as rigid or as closely knit as India's caste



system, that of Ceylon exercises a strong influence in certain matters, such as marriage and choice of occupation. The dominant caste in Ceylon is that of cultivators; such skilled workers as carpenters, blacksmiths, and goldsmiths come much lower down the scale, not to mention the still lower fishermen, potters, laundrymen, and the like.

Co-ordinate with the bias of the educational system and the influence of caste in restricting the formation of a class of skilled and technical workers is the unusual prestige accorded government employment in Ceylon. One meets it on every side. Wage laborers prefer a government job, hoping it will give them the security not obtainable in private employment. A study of high school pupils in four provinces showed that 75 to 100 per cent of the boys preferred the government to any other employer. But perhaps the best guide is the all but universal system of dowry, which in putting a price on the groom accurately reflects the community's estimate of the security and prestige of his employment. Here even government clerks command a premium over comparable nongovernment workers, while for a husband in the higher reaches of administrative service, the prospective father-in-law will endow his daughter most handsomely.

All these influences may be seen at work in the ambitions of secondary schools pupils, which correspond but poorly with the opportunities likely to be open to them. According to a study by Professor T. L. Green, of the University of Ceylon, 52 per cent of a fairly large sample of high school children aspired to employment in service occupations, whereas only 15 per cent of the population are employed in this group.<sup>3</sup> If several low-rated types of work are excluded, the concentration is even greater—about 50 per cent of aspirations directed toward occupations which employ less than 6 per cent of the total, among which those of doctor, lawyer, engineer, teacher, and government clerk and inspector rated especially high. On the other hand, only 25 per cent of the pupils cared to enter the basic productive lines which account for 64 per cent of Ceylon's active workers. Only in the distributive trades, such as transportation and commerce, did employment preferences and employment opportunities correspond closely (23 and 21 per cent respectively).

Now, of course, secondary school pupils are not representative of the entire population, and the disparity between ambitions and opportunities shown by these figures could doubtless be duplicated to some degree in other countries, even the United States. I merely use them to illustrate the low reputé in which skilled and supervisory labor are held. As Professor Green says:

<sup>3</sup> The data presented here are from an unpublished paper, "Curriculum and Social Needs in Ceylon"; the sample referred to consisted of 1,365 pupils drawn from all provinces.

Ceylon is in urgent need of high-level productive workers, the highly skilled workers and the well-educated foreman types who are of such importance in technological cultures. . . . Of this class of worker, many of whom are the products of high-level education in the West, there is no sign in Ceylon, nor will there be while manual work is despised and ill rewarded and while academic education is looked on as a method of escape from caste and poverty because, by leading to high professional level work it confers status and financial reward.

But a lack of workers with suitable technical and managerial skills is by no means the only socially rooted obstacle to industrial development. As in most other underdeveloped countries, there is among Ceylonese businessmen relatively little of that spirit of enterprise and venturesomeness which leads their peers in Western countries in a restless search for opportunities to produce new goods or to introduce new and improved methods. Willingness to risk capital in new and untried production is slight. Instead, investment in tea or rubber estates, in paddy land, in importing or speculating in merchandise is much preferred.

Ceylon's predominantly agricultural past, with its lack of industrial opportunities, no doubt goes a long way toward explaining these tendencies. So do the comparatively high yields, especially in recent years, from estate production and from speculative activities. More deep-seated is a sentimental attachment to the land, derived from centuries-long dependence on its bounty and from the high rank of the cultivator caste.

Operating to repress a spirit of enterprise are some of the basic traits of Ceylonese culture. Where one's rank in society is determined by status, whether decreed by caste or by other sources of social values, individualism in all its manifestations takes a back seat. Buddhism, too, tends to de-emphasize personal striving. Whereas individual effort is highly prized and highly rewarded in the West, in Ceylon and other Eastern societies it ranks relatively low in the scale of social values.

Also working to discourage industrial enterprise is the high value placed on government employment. The prestige associated with participation in the activities of colonial rulers accounts for this in part, but the security motive is also powerful, perhaps reflecting some underlying tendency toward insecurity among the Sinhalese people. In any event, self-employment ranks exceedingly low as an alternative to the youth of Ceylon.<sup>4</sup>

#### IV

Social and cultural obstacles to rapid change in Ceylon are formidable. If the value system were rigid and incapable of alteration or adaptation or the prospect of recruiting sufficient leaders to spearhead

<sup>4</sup> According to T. L. Green, *op. cit.*, an average of less than 10 per cent of a representative sample of secondary school boys chose self-employment, as against upwards of 75 per cent in favor of government employment.

change exceedingly dim, the outlook might be hopeless. There are, however, many signs that traditional customs are undergoing erosion: there is a substantial group of youthful and energetic sponsors of change both in and out of government and recruitment of additional personnel and development of appropriate methods of inducing necessary change are going on concurrently in several different sectors.

On the side of institutional change, the isolation of the village and therewith the hold of its traditional values is gradually diminishing. Thus a survey of four widely scattered villages<sup>5</sup> indicates strong approval of factory employment, if near at hand, even for daughters; approval of merit as against caste status as the basis for civil service employment; and approval of success achieved through self-effort as opposed to inherited class position. Though isolated chinks in the old pattern, there is a strong tendency for these to spread. This is enhanced in Ceylon by the comparatively high literacy of the population and by its relatively good system of communications and transport.

Ceylon fortunately possesses two recently developed agencies of change which promise to play a role of increasing importance. These are its co-operative societies and its rural development societies. There are three principal types of co-operatives: retail stores, credit societies, and production and marketing societies. From the point of view of helping the cultivator acquire better seed and implements and encouraging him to make effective use of them, the last two are the most important; these today reach one out of each four or five villagers. Because they use local personnel which knows what the peasant wants and what his problems are, these agencies have developed a grass-roots approach which takes suggestions as well as gives them. This is their great strength, for it is through local people who have the peasant's confidence that he can be most effectively induced to change his habitual routine. But it is also their weakness, for there is a shortage of local people who are sufficiently literate, honest, forceful, and responsible to assume local leadership. This means inefficiency and comparative failure in some local societies and inability to extend them as rapidly as would be desirable. There is no solution short of a gradual spread of literacy and a gradual increase in technical competence among the local populace.

But the co-operative societies are not alone in the field. More than five thousand rural development societies, under the guidance and direction of a hundred-odd officers of the government's Department of Rural Development, enlist the efforts of local people in making their communities better and more productive places in which to live. They do so by planning, organizing, and executing projects such as the con-

<sup>5</sup> Bryce Ryan, "Ceylonese Value System," *Rural Sociology*, March, 1952.

struction of roads, wells, latrines, recreation facilities, and the like. The government, in addition to lending the assistance of its central staff, now furnishes some of the materials needed and is training several thousand village workers for these communal tasks at various training centers. Plans now under way look toward increasing the number of these societies to cover most of Ceylon's 20,000-odd villages.

Another parallel attack on the problem of agricultural improvement is being sponsored by the United Nations. This is the Fundamental Education Project, administered by Dr. Spencer Hatch and a staff of six technicians. Its purpose is to train Ceylonese nationals both in the technique of improving agriculture and conditions of village life and in the equally important technique of skillfully imparting this knowledge to the villager, so that he may receive the education fundamental to the betterment of his way of living. These trainees will become the natural leaders of co-operative and rural development societies; so the program should help solve their problem of inadequate leadership and greatly strengthen them as agencies of rural progress.

Reverting now to the industrial sector, two approaches have been suggested as possible means of overcoming the lack of initiative and enterprise and the tendency of capital to seek comparatively unproductive outlets. To remedy the lack of knowledge of local materials and of possible local adaptations of modern techniques—essential if local enterprise is to be activated—the Mission recommended the establishment of an institute of applied research, making use at first of some foreign technical staff but later relying upon Ceylonese personnel. As a means of stimulating enterprise to exploit possibilities of profitable production discovered by the research institute, it recommended the establishment of a development corporation. Its tasks would be to encourage private investors to undertake new ventures, furnishing them with technical, managerial, and financial aid, or, if necessary, to initiate such projects itself, withdrawing in favor of private interests as soon as feasible. Enabling legislation is in the mill to set up these two institutions; if as successful as the best of them have been elsewhere, they should do much to energize and channel private enterprise and capital into activities beneficial to the country's economy.

Finally, the government of Ceylon has itself, independently of outside suggestions, undertaken a fundamental reform of its educational system. Far greater stress is to be laid at all levels upon practical work with direct relevance to the probable workaday interests of the majority of pupils. This emphasis will be less in the later grades for those with predominantly academic interests. In addition, several provincial vocational schools are to be established, to complement and expand the work of the existing one in Colombo.

## V

Ceylon faces a challenging task in its program of economic development. Potentially, this program can bring some improvement in the lot of the average man over the next few years and, even more, lay the foundation for future advance. Yet this potential progress may be swamped by growing population unless new attitudes favorable toward necessary change can be implanted in the peasant, the businessman, and future workers and technicians. The crucial problem is not one of finance, nor of feats of engineering, but one of molding the views and motives of human beings.

To meet this problem, Ceylon has a number of advantages: an experienced and competent government administration, a comparatively advanced co-operative movement, and energetic leadership in critical spots. Educational reforms now being carried through should equip far more young people with the kind of skills needed and may suffice to break down deep-seated occupational prejudices.

In time, no doubt, the required changes in social values and attitudes could be brought about. It has been done before. The pessimist would recall that to replace feudal values in Western Europe with those of an industrial society took four centuries. This analogy, however, is hardly fair. The change was unguided—a part of the very process of history. Ceylon and other underdeveloped countries are surrounded by a different kind of society and are consciously trying to adopt and adapt certain of its values as a means toward the goal of development. Awareness of the central importance of this task and a focusing of attention upon it should help speed its accomplishment. Even so, altering social customs and traditions, not to mention raising the level of technical competence of a substantial part of the population, is a slow procedure at best. It must probably be reckoned not in years but in decades. The conclusion seems clear: Although Ceylon is in a favorable position to achieve comparatively rapid change, for the immediate future of the next decade or so it will do well to avoid any decline in the standard of living unless the development program is accompanied by a vigorous and successful attack on the problem of population control.



## DISCUSSION

EDWIN P. REUBENS: Perhaps the basic difficulty in the theory of economic development is the necessity of dealing with behavioral relations and not merely logical deductions from simple assumptions. The analyst must explain, and even forecast, the human behavior resulting when specific elements are injected into a given total situation which is exceedingly complex. This is of course the characteristic stumbling block in the social sciences; it is a stumbling block which economists have frequently avoided by taking refuge in high abstractions and mathematical models—a refuge which our brother social scientists have alternately envied and denounced! Studying real behavior is very different, for example, from deducing the equilibrium level of the national income when the investment injection and all the propensities are given. Developmental studies are more like explorations and forecasts of business cycles, where only the broadest institutional features are held constant. The two fields also share the problem of conceptualizing the limits of a process where the economist's traditional criterion of equilibrium is either quite irrelevant or is profoundly changed in meaning. Indeed, most of the defects of the developmental literature—which is still in its infancy—may easily be paralleled by the persisting defects of the business cycle literature, which has already reached its middle age!

What the developmental literature needs—as Professor Kuznets has emphasized—is deep and probing studies of various economic societies, historical and contemporary. It might be hoped that studies of this kind would be undertaken by the technical assistance missions, such as those discussed in these papers. As a matter of fact, however, not very much original research can be done in the limited time available. On the whole, the investigators assemble and interpret such data as already exists, supplemented by personal observations; and they inevitably bring with them certain preconceptions and take over certain of the opinions and viewpoints of the local people whom they consult. In addition, the opportunities for integrating the recommendations of the various technical specialists in the mission are somewhat limited. To be sure, the eventual report does throw a bridge of recommendations across the gap between theory and practice; and the papers both express a broad awareness of the social factors which condition economic action in the countries discussed. Quite aside from the limitations of data and time, however, the papers show the lack of an explicit doctrine, both on economic development as a whole and on the particular role of technical assistance. The significance of the papers must therefore be considered in terms of the assumptions implicit in the analyses and recommendations.

Since there does not exist an articulated and generally accepted theory of economic development, it is difficult to set up criteria for judging and evaluating any particular analysis. However, while we do not have a whole physics, perhaps we are already in possession of a good deal of the metaphysics, or

conceptual structure, which can be used for this purpose. We may begin with the definition itself of economic development. There is widespread agreement on a minimal definition of economic growth as an "increase in national product per capita." There is also a growing agreement that economic development involves much more than this and in fact involves the distribution and realization of increases in real product, and above all involves a cumulative process which at some point becomes increasingly self-sustaining (even though the initial push or acceleration may have been exogenous).

This broad concept of development in turn implies certain categories or aspects of the developmental process which must be covered if a given theory or report hopes to be adequate to its subject. Four principal variables may be suggested and conceptually isolated: the production functions (including both direct production and social overhead capital), which are to be changed in the direction of increased productivity; the economic circumstances (domestic and foreign, including factor supply and consumer demand, relative prices, credit availability, and the like) which affect the prospect under possible changes in the production functions; the socioeconomic structure which permits or obstructs changes in the productive functions; the socioeconomic propensities, in the aggregate and by social class, and ranging from the propensities to consume and to invest all the way to the discount of the future and the interest in adopting innovations.

This fourfold classification runs parallel to that suggested by Professor Rostow in his recent book, *The Process of Economic Growth*, but divides the variables so as to emphasize factors which are disparate for analysis and for policy making. It will be noted that such a conceptual structure applies not only to a theory of economic development but also to other more traditional areas of economic thought, from market theory to national income doctrine, except that in those areas the third and fourth variables—structure and propensities—are usually taken as given and constant.

In a retarded country which is to be developed, probably all four of these variables must be altered; and the alterations are intercorrelated. The production functions must be changed because the effective supply function is inelastic, due to full employment (at least in the sense of bottlenecks at one or more points in the production line, especially in capital facilities). The economic circumstances must be improved because the traditional private economy does not initiate many innovations and usually does not possess the necessary resources at all or does not make them available. The social structure and propensities must be transformed because the private economy before modernization does not respond well merely to stimuli of changed economic circumstances (such as a sudden and brief export boom, sporadic inflows of foreign capital, or the entry of technical assistance).

Another vital conceptual element in a theory of economic development would be an emphasis on the scarcity of resources. Since it is not possible to pursue all lines, allocating enough resources to all four categories to ensure adequate change, the problem is to make sure that a given resource allocation to any one of the four variables also provides enough support to the other three to ensure sustained and cumulative progress. The great desideratum is to find

measures which will promote all the variables in their interrelations; i.e., to find "strategic factors."

This very brief sketch of the requisites of a developmental theory provides some basis for comparing the different types of current approach to economic development. Six main types may be noted: foreign capital assistance by governments, as in the Mutual Security programs for Southeast Asia; the lending operations of the International Bank; direct private foreign investment; international trade policy; technical assistance projects; and the domestic efforts of the peoples and governments of the underdeveloped countries themselves. Allowing for a considerable number of variations and exceptions it may perhaps be said of the whole pattern of these approaches that principal attention is being given to the first variable, the production functions, although not always broadly enough to encompass external economies and social overhead capital; that a little attention has been devoted to the second, the economic circumstances, and to the fourth, the propensities; and that the third, the socioeconomic structure, has been approached most gingerly or avoided altogether.

The papers reviewed place great emphasis on the technical assistance category and contain much wise counsel for maximizing the developmental benefit from the use of foreign experts and trained natives. There certainly is an important role for technical assistance, if directed to those strategic factors which can be influenced by expert knowledge and co-operation. But these papers also recognize certain limitations of this approach and, in fact, point to sectors where substantial funds must be spent and real resources must be moved. However, there is a more fundamental limitation upon technical assistance; namely, the extent to which a handful of experts, coming from outside and from above, can generate cumulative progress without massive alterations in the conditions of life and in the real opportunities available to the people. Here arise the essential questions of developmental theory.

In both papers the approach is gradualist. They recommend a large number of small projects rather than a few big ones. They urge a progressive evolution, beginning with improvements in activities which are already familiar and well established. In effect, they seek to avoid any sudden and drastic shift in the production functions or in the other variables. Perhaps the most important expression of this approach is the emphasis upon agricultural improvements in both papers (and the lack of emphasis upon industrialization).

Yet emphasis is laid with almost equal stress (and with larger sums of funds) upon transportation, power, vocational training, and sanitation. If resources are plentiful enough to permit so broad a program, one would expect numerous other measures (especially in the industrial field) to ensure optimum scale of new firms as well as external economies which would render feasible other productive innovations. On the other hand, if resources are quite limited, one would like to see a pattern of developmental priorities worked out in functional terms and not merely in terms of immediate absorptive capacity and multiple needs. What is required is not comparative statics but temporal dynamics. In particular, one would like to have the rationale for the strategic position assigned to agricultural improvement, which in the sector of subsis-

tence farming seems so slow and laborious a course for planned development, while its gains tend to be swallowed up in local consumption without adding to further capital formation.

Furthermore, the papers look for important changes in the socioeconomic propensities by means of direct action—education, public appeals, demonstration projects, extension work, and the like. As the recommendations do not greatly insist upon broad and deep changes in the economic circumstances and structure and in fact are greatly concerned with preserving stability, the authors appear to hope that basic changes in mass and group attitudes will come about largely by the contagion of ideas. Important as this approach is, it seems to understate the social factors which condition any set of propensities and whose alteration offers keys to the transformation of the propensities themselves.

It may be doubted that the rules laid down by the present-day technical assistance missions would have permitted, for example, the rapid development of a country like Japan, whose status in the last century and early years of this century closely resembled many of the underdeveloped countries today. In Japan, the production functions were transformed rapidly even in the nineteenth century and even more rapidly during the intensive industrialization which followed the Sino-Japanese War. This swift progress was stimulated on the one hand by important changes in economic circumstances, including not only advances in foreign trade but also a persistent domestic inflation, and after 1896 the floating of substantial foreign loans of general-purpose type. On the other hand, the progress in production and capital formation was fostered by the structural upheavels which put an end to old-style feudalism, commercialized the economy even unto agriculture and handicrafts, and created a vigorous entrepreneurial class which rose to very nearly the top of the social pyramid; while at the same time peasants and industrial workers were kept unorganized and generally docile. Finally, the basic propensities—which to be sure had always been in a measure positive, practical, and eclectic—were directed into progressive, long-range lines by the changes in productive capacity, in economic circumstances, and in social structure, as well as by direct Western influences on the intellectual level. In this whole pattern, both agricultural improvement and foreign experts played an important role, but neither could supply the crucial strategic stimulus that came from the improvement of economic circumstances and the transformation of social structure and propensities. The Japanese developmental procedures were neither democratic nor painless. But they preserved private enterprise and commercial incentives in collaboration with government, and avoided the planning errors, the wasteful autarchy, and the brutal compulsions that have marked economic development under the Soviet Russian regime.

In a word, the Japanese took bigger chances and made more drastic alterations than a modern mission would have advised. But it may be that the chances and alterations which the Japanese undertook were a *sine qua non* of their rapid growth. An underdeveloped country which does not move so broadly and strongly may not be able to sear out of the gravitational pull of its ancient stagnant order, may not raise the national product faster than the



population, and may never achieve sustained upward flight. If external assistance does not come to its aid in adequate volume and type, that country may never achieve cumulative development at all.

Nevertheless, even with generous foreign aid, resources will always be limited. Consequently there will always be the economic problem of choice among alternatives. Such choice will become more rational if we can isolate the strategic factors in economic development, trace their interconnections, and understand their temporal dynamic role. Several commentators have already focused attention on the crucial role of supply and demand interrelations, external economies, social overhead capital, industrial occupations, urbanization, sustained improvement in terms of trade for primary produce, and inflow of general-purpose foreign funds. Most of these variables appear in the categories of productive functions and economic circumstances. More attention must be given to transformations of local structures and propensities. Above all, such transformations or "reforms" must be considered in relation to, and indeed often by means of, the more specific forms of economic action.

JOHN B. CONDLIFFE: We have listened to two admirable papers by men who have drawn upon their personal experience in advising responsible and practical efforts at promoting economic development. They open many avenues of discussion and suggest many intriguing questions. So many development projects are in the tropics. What weight ought we to attach to climate and its influence both on men and on the earth itself?

Economists are now called in and expected to advise on practical action programs. They are called in by governments—either by the governments of newly independent countries, by governments who wish to aid them in speeding up their development, or by governments combined in international agencies. Is there a presumption of necessary government or intergovernment action? How far does this set a pattern of economic organization? Does it have a bias towards programs of self-sufficiency and away from economic interdependence? Ought we to question this presumption of government responsibility for economic development?

The economists thus called in to advise governments are not in the happy position assumed by Professor Higgins when he summed up his answer to the question: what do economists know?<sup>1</sup> He assumed that a group of economists chosen by the Royal Economic Society would be given "unlimited legal powers" and a century to work in. On these assumptions he concludes that economists might increase national income by 50 per cent more than might be achieved under a *laissez faire* regime. By this I presume he means that if the *laissez faire* increase in productivity is, say, 3 per cent per annum, economists using unlimited legal powers might raise it over a century to 4½ per cent per annum. But our consulting economists are expected to do much more than that and to do it right now, with no power beyond that of persuasion.

Inevitably they become involved in the process of persuasion. Indeed, they are tempted often to concentrate on the bottlenecks of development which are

<sup>1</sup> Benjamin Higgins, "What Do Economists Know?" (Melbourne University Press, 1952), p. 28.



largely noneconomic and to hope for the best in regard to macroeconomic results. They tend to become preoccupied with the social and cultural backgrounds of economic activity. They find themselves coming to conclusions and advocating action policies in regard to elusive psychological, educational, ethical, and philosophical questions rather than economic questions such as full employment, inflation, the optimum allocation of resources, and income distribution. I could echo most of what Professor Ellsworth has said in regard to the status of women, vocational education, agricultural conservatism, and cultural resistance to change—and apply it to the Near East countries.

This raises the issue I should like to discuss briefly. It is the old issue of an economist's scope of competence. Two recent meetings of the Royal Economic Society have been devoted to addresses on this question.<sup>2</sup> Whenever an economist is called on, as Professors Britnell and Ellsworth have been, to give advice on a practical program, it always becomes a real issue whether, as Hawtrey argues, he can maintain his self-esteem, faith, and confidence only by integrating economics and ethics, or whether, as Robertson maintains, he should confine himself to the more material aspects of human welfare.

Clearly, when an economist seeks in a practical situation to apply thought to action, he must rely heavily on his judgment in regard to many imponderables that lie beyond the range of his economic calculus. He may feel reasonably sure of his judgment when he is working in a familiar social environment. All his life he has exercised such judgment and he knows at least the broad lines of systematic thought in related social disciplines.

When he is called on to exercise judgment in an unfamiliar alien environment, he is on treacherous ground. There has been surprisingly little systematic thinking about the psychology, ethics, and philosophical attitudes of peoples undergoing economic development. The economist therefore can do little to prepare himself. He can read some history and geography of the region he is to work in, perhaps some translated literature and folklore, even some religious works. But he is apt to feel uneasy and unsure of his judgments and assumptions about human nature in a strange and changing environment. The assumptions he has derived from observations of what Walter Bagehot once called "the great commerce" of developed industrial countries are of doubtful relevance. He is often urged instead to seek guidance from cultural or social anthropology.

My limited purpose today is to raise some doubt as to the extent to which an economist called in to advise on economic development should be intimidated by cultural or anthropological considerations. This is what I understand Professor Viner was doing when he referred recently to "the stubborn resistance to change . . . of . . . primitive peoples which the anthropologists have been emphasizing . . . as invulnerable barriers to the acceptance of even the most urgent and the most rewarding economic reforms."<sup>3</sup> It is also, I

<sup>2</sup> R. G. Hawtrey, "The Need for Faith," *Economic Journal*, September, 1946; and D. H. Robertson, "On Sticking to One's Last," *Economic Journal*, December, 1949, reprinted in *Utility and All That* (London: George Allen and Unwin, 1952), pp. 60-65.

<sup>3</sup> Jacob Viner, "America's Aims and the Progress of Underdeveloped Countries," in *The Progress of Underdeveloped Areas* (University of Chicago Press, 1952), p. 197.

think, what Professor Robertson had in mind when he felt sure "that if the economist is in too much of a hurry to pose as the complete man—too anxious to show that he is duly sensitive to 'the changed temper of the age' and has taken full account of what is 'politically and psychologically possible,' he will be in danger of betraying his calling."

It is true, as Professor Ellsworth has emphasized, that the crucial problem of economic development is psychological—the necessity of creating an effective desire for development, of touching the springs of human action to promote self-improvement. The methods adopted must be primarily educational and quick results are not to be expected from the educational process.

It is also true that the most direct and effective methods of increasing productivity may enrich the already rich and drive the mass of the people into still more desperate poverty—at least for the time being. Yet the overruling fact, as in all industrial revolutions, is the need for greater productivity. The surprising thing to me is the emergence of urban distress in agricultural communities, paralleling the developments of the Industrial Revolution in England. The only ultimate cure for this urban overcrowding, as well as for agricultural poverty—and the only way to avert Malthusian calamities—is a rapid stimulation both of productivity and of external trade.

The economist will naturally seek to equip himself with as much insight as he can gain into the psychological and sociological backgrounds of human behavior in the very special conditions of a country in search of development. But this does not mean that he should give undue weight to those backgrounds. Indeed we are learning (what we ought to have known) that education is the essential instrument of economic change. There are some social customs that ought to be destroyed even at the cost of social dislocation and distress. It is not always clear that social stability ought to take precedence over increased productivity as an objective of social policy. It is sometimes possible to look on social institutions as museum pieces rather than as agencies of human betterment.

The easiest way for an economist to avoid taking decisions on such questions is, of course, to ignore them. This, however, is seldom possible in practice. He must therefore make up his mind whether economic objectives and the means of attaining them should dominate his recommendations. This may involve choices between recommending private, foreign, or local enterprise or new and untried forms of government enterprise. The latter are particularly hazardous in most underdeveloped countries, since as a rule their governments are neither firmly established nor highly organized. It may also involve substantial decisions as to the importance of foreign trade as distinct from production for the local market. Professor Britnell's emphasis on Guatemalan coffee exports and Professor Ellworth's discussion of Ceylon's precarious dependence on export markets illustrate this dilemma.

My own view is that the economist should not be afraid to stress economic objectives—and particularly increased productivity and international economic co-operation—as of overriding importance. This clearly is a value judgment, but I believe it can be justified both by historical analysis and by field observation. If there is to be any solution of the political and social problems of

these underdeveloped areas, increased productivity must be preferred to political objectives such as national power and prestige. The preservation of folkways and archaic custom should not be allowed to stand in its way. Nor should the susceptibilities of sensitive new bureaucracies persuade economists to encourage false hopes of ambitious state enterprises.

In this shrinking world it is equally important to lay stress upon the values of international co-operation and interdependence. Such a viewpoint may run counter to prevalent currents of nationalism and national economic planning. It may even seem an ungracious reply to hospitality. But economists have a duty to proclaim the realistic truths derived from the often bitter experience of the past. The underdeveloped countries deserve from us something better than acquiescence in prevalent attitudes which so often lag behind those discarded elsewhere. Between those who seem fearful of all change and those who would plunge into experiments in planned economies of self-sufficiency, the economist must keep his vision focused on the ordinary people for whom increased productivity means health, education, and ultimately political liberty, even more than it means wealth. Such objectives can be attained only in close economic association with other free peoples. To say less would seem to me to betray our calling.

## THE UNITED STATES DEMAND FOR IMPORTS

### THE UNITED STATES DEMAND FOR IMPORTS

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#### I

In this paper, I shall deal with certain quantitative aspects of the United States demand for imports. It would not be possible, of course, to give a comprehensive report of the econometrics of the subject. There are, for example, interesting questions concerning the structure of these imports, especially the particular type of finished manufactures imported as compared with those produced and exported, which deserve further investigation. I must limit myself here to reporting about the work I have been doing<sup>1</sup> over several years in establishing import functions for the United States where the imports are related to important other variables of the United States economy and to comparing this work with the results obtained by other investigators. I shall deal, first, with the interwar period. For the postwar period, I have more questions than answers, but I shall advance a hypothesis concerning the now existing import functions of the United States which may be a starting point for further discussion.

Imports are the difference between domestic demand and domestic supply. It would be most desirable to study the condition of demand and supply for individual commodities, both at home and abroad, and to obtain in this way a complete explanation of the United States imports. Most recently, import forecasts have been made on what comes relatively close to a commodity basis. Input-output analysis, to which the National Income Conference recently devoted two full days of discussion, proceeds by determining the input requirements arising from a given final demand for specific goods. If the domestic capacity to produce can be estimated, import requirements as associated with the final demand could be determined. The advantages of this procedure (as of any commodity-by-commodity estimate) are obvious; much better care than in an aggregate analysis can be taken of the specific needs of an economy the operations of which are greatly affected by the progress of armament.

<sup>1</sup> H. Neisser and F. Modigliani, *National Incomes and International Trade*, to be published 1953 by the University of Illinois Press for the Institute of World Affairs. Part of the material was circulated years ago in mimeographed form.

On the other hand, the benefits which the law of great numbers bestows on statistical analysis are almost certainly lost by disaggregation reaching down so closely to the commodity level. The technical coefficients used in the input-output analysis may be free of error, but the same cannot be said of the estimates of capacity and domestic supply in the various industries; and the assumptions concerning the composition of the final demand, which includes all imports directly consumed, depend to a large extent on estimated relations between a projected GNP and the domestic demand for specific goods; these estimates cannot be as reliable as estimated relations between larger aggregates. These remarks are not made as a final criticism, but rather as an explanation of why this paper is limited to a presentation of the results of what may be called the aggregative analysis.

This branch of import analysis has limited itself to estimating the relations of import volume to certain independent variables, like income, price, etc., which have been treated as given by the analysts though theoretically they are determined in the same economic process as imports are. The question as to what extent the coefficients of more comprehensive models can be estimated will not be discussed here. I accept the traditional approach, but I have to discuss one important problem which arises from the fact that imports can be considered as the difference between domestic demand and domestic supply. If the domestic supply is zero, as for many raw materials and about 50 per cent of the food imports into the United States, the import function will be identical with the consumption function for the good in question. If, on the other hand, the domestic supply in the short run depends on noneconomic factors like the weather, it may be necessary to retain supply as an independent variable. But if goods imported are also produced at home (or, in case of aggregate analysis, if close substitutes are produced at home) and if the domestic production in the short run depends primarily on economic factors, the traditional linear import function is in need of justification. It is compatible with a linear (or nearly linear) consumption function only if the supply is also linearly related to income.

There is nothing in traditional theory which would make the supply of an individual good directly dependent on income. In general, domestic supply is the function of the price of the good and the prices of its cost elements. I shall discuss the price factors at a later point of this paper. Here, I limit myself to stating without elaborate proof a proposition easily deducible from the well-known Cunyngname-Barone scheme for the foreign trade of one good between two countries: a shift in income will change both the amount domestically supplied and the amount of imports in the same direction, except, of course, in case



of constant costs, which would exclude imports besides domestic supply or domestic supply besides imports. It is this fact which, wherever noneconomic factors do not play a role, allows us to retain the linear relation between imports and income, at least where we deal with sufficiently large aggregates in which the case of zero domestic supply is rather frequent and operates by itself in the direction of a linear relation between the aggregates. But it should be realized that the procedure is far from being ideal and is primarily dictated by the impossibility of obtaining satisfactory domestic supply functions.

## II

As will be clear by now, I am a strong adherent of disaggregation down to the level of the principal import categories, and possibly somewhat further, though not much further. One advantage of this approach lies in the wider choice of the independent variables. The raw material imports can be expected to be more closely related to industrial output than to income—a fact that is also acknowledged by other investigators, for example, by the Federal Reserve Bank study (as I shall briefly call the publication of the Federal Reserve Bank of New York: *The Pattern of United States Import Trade Since 1923*, by J. H. Adler, E. R. Schlesinger, and E. van Westerborg). The food imports on the other hand can be expected to be more closely related to some such category as disposable income, and for the finished manufactures national income may prove most acceptable. As pointed out before, we found it necessary to introduce into the food import function a domestic supply variable; viz., crop output one year lagged. This necessity is confirmed by the low simple correlations obtained for this category by both the Federal Reserve Bank study and R. Hinshaw in an unpublished memorandum for the Board of Governors of the Federal Reserve System.

In the following table, crude materials and semimanufactured goods are combined (with weights 2 and 1, respectively) as "raw materials," and crude food and manufactured goods appear as food category.  $Q$  denotes Fabricant's index of industrial output, base year 1928;  $\bar{Y}$  denotes disposable income, and  $Y$  national income in millions of 1928 dollars;  $S$  denotes the Barger-Landsberg crop output index one year lagged, base year 1928.

TABLE 1

## UNITED STATES IMPORT FUNCTIONS, MILLIONS OF 1928 DOLLARS

Raw materials	1925-37	18.41 $Q + 309.62$
Food	1925-37	.0157 $\bar{Y} - 10.35 S + 836.24$
Finished manufactured goods	1921-37	.0127 $Y - 79.29$

The two other studies of import categories (Federal Reserve Bank

and Hinshaw) omit domestic supply as independent variable for food imports and obtain, therefore, correlations which are not comparable. Hinshaw covers a longer period, 1919-37, for food materials and semi-manufactures, and 1920-37 for finished manufactures. It is known also from other studies of the over-all import propensity (De Vegh) that in these years the level of the import propensity was abnormally low.

TABLE 2

THE UNITED STATES MARGINAL PROPENSITY TO IMPORT—INTERWAR PERIOD  
(With Respect to National Income)

	<i>Hinshaw</i>	<i>Neisser-M.</i>
Raw materials	.024	.0287
Finished manufactures	.008	.0127

For raw materials I have recomputed our import function and related imports to national income to make it comparable.

The Federal Reserve Bank study estimates equations for imports from specific areas and introduces other independent variables. It would be difficult to make it fully comparable.

The statistics as here presented do not show one phenomenon of particular interest; namely, the sharp drop in the import propensity for raw materials in 1938 and 1939 (the regression coefficient on industrial output fell from 20.78 in 1925-33 to 17.23 in 1934-39, with constants virtually unchanged). The beginning of this decline can be graphically traced back to 1934. It was caused less by the substitution of domestic materials for foreign ones (there is, besides the silk-rayon substitution, not much evidence in this direction) than by a tendency to economize in the input of raw materials. This has recently been shown also by Professor Leontief's input-output analysis.

It is also possible to estimate significant, though not quite so satisfactory, over-all import functions for the interwar period which relate total imports to national income. We may disregard here estimates based on a comparison of current values of import and income, in which the result must be distorted by the common price factor, and estimates of correlation between series for which, in an unexplained manner, a trend was eliminated (Chang's estimates).

TABLE 3

UNITED STATES OVER-ALL IMPORT FUNCTIONS

Neisser-M.	1925-37	1.234 + .051	Y — .0114	S
Hinshaw	1920-37	.041	Y	
Staff Memo IMF	1919-39	390.8 + .042	Y	
Adler*	1922-37	.037	Y	

\* *American Economic Review*, 1945, p. 427.

Our estimate is in million dollars of 1928; that in the Staff Memo

R.D.-511 for the International Monetary Fund in million dollars of 1919-39.

The differences between our estimate and the three other estimates are not only due to the inclusion of more years in the latter but also to the fact that our estimate is obtained as the sum of three separate import equations for the main categories of which the food import equation includes domestic crop output as second independent variable. I confess that I am puzzled by Dr. Adler's lower estimate.

### III

There remains to be discussed the problems of the price effect, of the influence of protection on imports, and of the distribution of imports over various countries of origin—problems which are related to each other but not identical. We may disregard for the United States the influence of capital movements, which for other countries is of great importance.

For lack of time, we must refrain from presenting results obtained for the last point; viz., the distribution of United States imports over the various export countries. The Federal Reserve Bank study is particularly devoted to this problem and has obtained a number of satisfactory results for raw material and manufactured goods imports, though not for food imports, by classifying the imports according to regions of origin; but even in the first-named categories it was not uniformly successful. Another approach operates via export functions of the various countries or groups of countries. Polak's study (which I discussed at a former meeting of the Association) and our investigation have used this approach. Exports from one country are considered correlated with the imports of the various customer countries, due account being taken of structural changes by way of a time trend and of price effects. Clearly, this approach implies the existence of a certain pattern of countries of origin for the imports of any particular customer country; but only a long-winded, detailed description could make clear the theoretical and statistical premises and explain the result.

As to the effect of relative price changes on imports, there exist serious statistical difficulties elaborated by Professors Orcutt and Harberger; again, lack of time prevents me from discussing their results. I do want to point out, however, that the use of price ratios, e.g., domestic prices over import prices as independent variable, and the breakup of imports according to categories and regions invalidate the methodological criticism to a smaller extent than the Federal Reserve Bank study seems to assume.

Some general theoretical remarks about the nature of the price varia-

ble in the correlation analysis of time series of imports may be permitted.

The classical approach to our problem is based on the premise that the delivered prices of any commodity in a certain market are the same regardless of origin, but that no comparable price equalization tendencies exist internationally for the factors of production, especially not for labor. Hence, the volume of foreign trade will be governed by the comparative cost-price ratio, as we may say briefly: we compare efficiency wages in the various countries, and if for one imported good or a group of goods the average efficiency wage level falls below the average efficiency wage level of the same group abroad, we would, other things being equal, expect a decline in imports. Devaluation would operate primarily via this mechanism in fostering domestic production at the expense of imports.

This approach has been neglected in the econometric analysis of time series. In our own study we also came regretfully to the conclusion that the approach is statistically not practicable. One reason is that the classical effect is much more powerful in the long run than in the short run, while the time series analysis catches primarily short-run effects. But as we shall see, the approach has been made fruitful in a cross-section study by Mr. MacDougall.

In general, econometricians have preferred to study substitution relationships. The composition of the United States output differs from the composition of the imports. Hence, a price fall of imports may cause a substitution of foreign goods for domestic goods of a different kind or quality. The larger the share of import items with a low substitution elasticity, the less chance exists to observe such price effects in an over-all import analysis.

Even if we analyze the imports according to main categories, we would not expect to find much substitution between categories, nor, for technological reasons, within the category of raw materials. However, the Federal Reserve Bank study has established a price effect in the raw material imports from Europe and from the "rest of the world" (i.e., excluding sterling area and America), which together provided almost 50 per cent of the United States raw material imports. Since also the substitution, directly or indirectly, of domestic materials for foreign ones requires, other things being equal, an abnormal increase in the domestic output of raw materials, which is not observable during the period in question, the Federal Reserve Bank result represents a puzzle, to be explained by further investigation. No good results have been obtained for the price effect on food imports, presumably because there is little substitution between the main components of

these imports (coffee, tea, cocoa, sugar, bananas, whiskey) and the domestic product. Only for manufactured goods imports can we hope to find a substantial substitution effect.

TABLE 4  
ELASTICITY OF IMPORTS WITH RESPECT TO PRICE

<i>Neisser-M.</i>		<i>Average Elasticity</i>
Finished manufactures, exclusive of burlap and newsprint	1932-38	1.67
<i>F. R. B. Study</i>		
Finished manufactures from ERP countries	1923-37	2.4
	1931-37	2.9

I consider the results of the F.R.B. study as more reliable than those of our study because the price variable used there is more refined. They are also confirmed by Mr. de Vries<sup>2</sup> evaluation of certain estimates of the United States Tariff Commission, which refer to the effect of tariff changes for 176 commodities on the volume and value of United States imports, though the estimates pertain to the long-run effects as well as to the short-run effects.<sup>3</sup> In spite of the downward bias of such estimates, we notice with some relief that a substantial elasticity of substitution existed.

As to the United States tariff policy during the interwar period, Adler has already shown in his earlier study that the quantity of duty-free imports after 1920 always rose much more, or fell much less, than that of the dutiable ones. The marginal propensity to import duty-free merchandise was, in the period 1922-37, about 40 per cent higher than that for total merchandise. The duty-free list could, for technical reasons, only include goods which were free of duty during the whole period, but obviously the error committed by this procedure would make the difference in the behavior of the two groups appear smaller than it actually was.

Whatever the ultimate judgment about the reliability of the elasticity estimates from time series will be, we have other material which confirms beyond doubt the classical doctrine of the importance of the price factor in general. The Federal Reserve Bank study points out that there is a negative correlation between the quantity changes in exports from the prewar period to 1948 and 1949 from six European countries to the United States and the corresponding changes in import prices. This is one example of the cross-section method which more systematically has been developed by Mr. MacDougall (*Economic Journal*,

<sup>2</sup>B. A. de Vries, "Price Elasticities of Demand for Individual Commodities into the United States," in *International Monetary Fund Staff Papers* (April, 1951).

<sup>3</sup>The F.R.B. study estimate of the price elasticities for manufactured goods imports from Great Britain (yielding an elasticity of 5.2) is not fully reliable because of the high intercorrelation between income and relative prices; it exceeds considerably de Vries' figures.



December, 1951, and September, 1952), from which we shall quote here only the results relevant for United States imports.

MacDougall compared for a number of products in the year 1937 the relative efficiency of labor measured as output per worker in the United States and Great Britain with the difference in wage rates (weekly wages) and showed that wherever the relative efficiency in the United States fell short of the wage ratio, British exports dominated in the world market, and wherever the relative efficiency in the United States exceeded the wage ratio, United States exports dominated in the world market. But this basic rule did not hold for the British exports to the United States; they represented only a small percentage of American domestic sales of the same type of good even where the efficiency-wage ratio comparison favored Great Britain. MacDougall was able to show, however, that in the year 1937, in the large majority of cases in question, the British superiority was offset by United States customs duties, and that for the remaining few cases transportation costs or indirect costs represented a sufficient explanation. As MacDougall points out himself, one must not conclude that, in absence of custom duties, British exports would have appropriated the American market wherever British industries were superior in the sense of the theory of comparative costs. MacDougall's analysis of the division of the world market between export countries shows clearly that a change of the export ratio in favor of one country never leads to complete domination of the world market by this country, but only to a gradual increase of the country's share. Obviously, the market for manufactured goods is imperfect; there are established preferences for the products of one country which can only be gradually overcome by changes in the price differential. This imperfectness of the market certainly is particularly strong where it is a question of substituting the products of a foreign country not for the products of another foreign country but for domestic products.

Basically the same conclusion should be drawn from time series analysis; even in the case of manufactured goods, the production of which operates more or less under the law of constant returns, a change in the price ratio does not lead, at a critical point, to a discontinuous change in imports, in the sense that imports would entirely eliminate domestic competition, but to a gradual increase or decrease.

Important as the confirmation of the law of comparative costs is, no quantitative conclusions concerning the United States import functions can be drawn from MacDougall's analysis. He has also shown the existence of a correlation between relative export quantities (British exports compared with United States exports) and the relative export prices in the world market. But no correlation of this kind exists for

the United States market, and even for the world market the correlations are at best significant, not satisfactory for prediction.

#### IV

I come now to the postwar period. I was not able to resist the temptation to apply our interwar equations for the main categories to the four years 1948-51. Here are the results.

TABLE 5  
UNITED STATES IMPORTS 1948-51  
COMPUTED ON THE BASIS OF INTERWAR FUNCTIONS  
(Millions of 1928 Dollars)

	Raw Materials		Food		Manufactures	
	Computed	Actual	Computed	Actual	Computed	Actual
1948	2,949	2,930	1,497	1,252	1,798	867
1949	2,671	2,644	1,505	1,349	1,733	846
1950	3,132	3,513	1,516	1,402	1,981	1,042
1951	3,429	3,229	1,551	1,475	2,151	1,117

We notice for the years 1948 and 1949 the extremely close agreement between actual and computed values for raw material imports—an agreement which, by the way, would not have materialized had we utilized national income instead of industrial output as independent variable.

This is a meager but not quite useless result. I obtained it already in 1950 when, of course, no data beyond 1949 were available. When I examined the over-all import propensity relative to national income for the years 1946-49, I was surprised to find that the slope had become much steeper, by 60 per cent, while the constant had fallen enormously. Of course, no correlation based on only four observations is significant even if the coefficient equals .997, as is here the case; and two more years of observation proved how deceptive these results were.

There is no other way but to examine the main import categories for the years 1946-51.

TABLE 6  
IMPORT FUNCTIONS OF THE UNITED STATES 1946-51  
FIRST APPROACH  
(Billions of 1928 Dollars)

	<i>r</i>	Equation
Raw materials	.780	.016 $\bar{Q}$ — .327
Food	.947	.017 $\bar{Y}$ — .997
Manufactures	.992	.020 $\bar{Y}$ — 1.818

$\bar{Q}$ , denoting industrial output, is here measured by the Federal Reserve Index corrected for the 1 per cent difference in the 1928 basis from the Fabricant index.  $\bar{Y}$  denotes disposable income, the correlation with which gave the best results.

The raw material function is barely significant on the 5 per cent

level, and the cause of the trouble must be sought primarily in the sharp import fluctuations in 1950 and 1951. The correlation in the food import function is somewhat spoiled by the unusually high imports in 1949. But deviations in one year scarcely allow conclusions concerning "the relative insensitivity of United States consumers of most food products to the minor declines in income. . . ." (Staff Memo, ENA—7 for the International Monetary Fund, page 4.) Moreover, import changes and consumption changes need not run parallel.

Unfortunately, the introduction of additional independent variables into a series of six observations cannot lead to significant results. (The Federal Reserve Bank study applied the price elasticities from the interwar period to the postwar years and evaluated in this way the Torquay concessions. I feel that this extension of interwar results is not in accord with the short-run character of the import functions.) The insertion of domestic supply into the food import function proved, too, irrelevant, presumably because the years under consideration were not part of a drought era. Nevertheless, I have some confidence in the raw material function as obtained (much more than in the manufactured goods function), because the result is in conformity with the interwar tendencies—a further small downward shift has ensued in these six years in the marginal propensity to import raw materials. I hope that other speakers will be able to offer an explanation of the deviations where I failed. I only want to remark that the explanation of the downturn in 1951 from changes in the inventory output ratio in the last quarter of 1950 would be incomplete. (Such an explanation is offered in the Staff Memo ENA/52/9 for the International Monetary Fund, page 13.) Can the influence of this factor be really demonstrated for the whole period 1946-51? And is this explanation compatible with the fact that in 1951, when imports fell, inventories instead of declining increased substantially? One could answer the last question in the affirmative only if in 1951 the composition of inventories has changed and domestic goods took to a considerable extent the place of foreign goods. But is there independent evidence for such a change in composition? For these reasons, I was more inclined to accept as explanation of the import decline the substitution of domestic for imported materials; but it seems that the output of domestic materials did not increase more than the industrial output. I hope that Dr. Zassenhaus' discussion will shed some light on the subject.

To obtain an over-all import function, we must again introduce a common magnitude of reference: national income. For purposes of comparison, the estimates are again made for the three main categories, and in the interwar food function the crop output was replaced by its constant average over the period 1925-37.

TABLE 7  
INTERWAR AND POSTWAR IMPORT PROPENSITIES  
(Billions of 1928 Dollars)

	<i>Interwar Function</i>	<i>Postwar Function; Second Approach</i>	<i>r</i>
Raw materials	.0287 $Y - .055$	.0303 $Y - 1.849$	.915
Food	.0096 $Y - .334$	.0107 $Y - .386$	.869
Manufactured goods	.0127 $Y - .079$	.0136 $Y - 1.245$	.958
	.0510 $Y - .468$	.0546 $Y - 3.480$	

The raw material correlation is now significant on the 1 per cent level; the food and manufactured goods correlations are slightly lower but still significant. The over-all marginal propensity to import and those for food and manufactured goods are slightly higher than in the interwar period, but the constants, except for food, much lower; in unit values of 1951, the difference in the constant for the total import function amounts to about 4.5 billion dollars.

But mere significance of correlation is not enough. For economic reasons, the results for raw materials and manufactured goods are not acceptable to me.

Let us first consider the function for manufactured goods. The correlation with disposable income is simply too good: the points lie virtually on one line and no effect is visible of the devaluation wave of 1949. Could the result not be spurious—caused by the structural rise of European and Canadian exports during the reconstruction and reconversion period 1946-48 and the upward shift 1950 and 1951 as consequence of the deflation and tariff concessions? If we, in conformity with prewar experience, examine the relation manufactured goods imports to national income, we discover the traces of such a development: the points for 1949 and for 1950 are above the regression line. It is tempting to conclude that only in 1948 reconstruction and reconversion had reached its end and allowed United States manufactured goods imports to obtain a normal level; hence, the line connecting 1948 and 1949 would represent the true regression, and the line 1951 to 1950, almost parallel to but on a higher level than 1948-49, would represent the import level appropriate to the devaluation and tariff changes. Using the latter slope as characteristic for the present situation and near future, we obtain a relation: manufactured good imports = .006  $Y + .06$ ; the slope is less than half of the simple regression 1946-51.

The same technique cannot be applied to the raw material imports as a glance on the scattergram would show, nor is there any compelling economic reason; for the United States raw material imports cannot have been retarded in 1946 and 1947 to the same extent as the manufactured good imports by reconstruction and reconversion. But the

obvious defect of the relation of raw material imports to national income is that it indicates an increase of the marginal propensity above the level of 1925-37, although we know that this level is already too high for the later thirties. The marginal propensity to import food relative to disposable income is also slightly higher in 1946-51 than in 1925-37. But we have here less reason to doubt such a change; and the interwar coefficient might have been slightly depressed by the introduction of crop output as a separate variable.

The relation of raw material imports to industrial output is, from economic viewpoint, much more trustworthy. It can be replaced by a relation of imports to national income only where the differences are not substantial. Here, where they are substantial but the introduction of national income is necessary for an over-all estimate, I simply corrected the coefficient in the industrial output correlation by the average ratio: national income to industrial output.

But this is not the end of the trouble. In the field of raw materials we have additional information from the reports of the President's Materials Policy Commission, which I must at least briefly touch upon. The projections of this study refer to a GNP twice as large as that of 1950, price ratios remaining unchanged. If we apply our industrial output function, which seems appropriate in this context, we find that raw material imports in prices of 1928 would rise from a computed level of 3.1 billion dollars in 1950 to a level of 6.5 billion dollars; i.e., by 111 per cent. But according to the report, the United States consumption of raw materials is projected to rise by only 64 per cent (*op. cit.*, Vol. 1, page 24). This figure needs some correction for purposes of comparison, since there are included the materials for food which are not covered by the raw material import category and construction materials, little of which is imported; and it must be remembered that our definition of raw material imports includes semi-manufactured goods. But these corrections cannot be assumed to close the gap between an 111 per cent estimated increase in raw material imports and a 64 per cent increase in raw material consumption.

It is, of course, possible, and to some extent likely, that a doubling of GNP would be associated with an increase in industrial output by less than 100 per cent, but, of course, it is also possible that the trend to economizing in the input of raw materials continues and causes a further decline in the slope or the constant of the import function. The Paley report may have good reasons to assume the existence of such a trend over the next twenty-five years.<sup>4</sup> An estimate of the import func-

<sup>4</sup>One may be inclined to argue that the domestic requirements for raw materials will rise more in the next twenty-five years than the domestic supply of raw materials and in this way bring about a higher rate of growth for imports than is projected for the requirements by the Paley report. But such a development would be at variance with the hypothesis



tion should not claim validity over more than seven or eight years, and for this period I consider my estimate given above as acceptable.

Utilizing for purposes of short-run prediction a simple relation between imports and income or industrial output implies, of course, a judgment about the probability of further basic price changes, especially from devaluation and United States commercial policy. Basic changes of this kind are not covered by the simple import function. In brief, I do not expect a further upward shift of the import function from such causes and no more than a very small downward shift as consequence of increasing United States protectionism. This judgment is predicated on the basic maxim of United States commercial policy, upheld by both Republican and Democratic administrations, though interpreted in a different spirit. Generally acknowledged is the American producer's claim to have his unit costs equalized by duties to the unit costs of the foreign competitor. Escape clauses and "peril point rules" now protect this claim. It is not necessary here to dwell on the difficulties inherent in this concept of cost equalization from the angle of marginal theory. Suffice it to point out that the first, seemingly considerable, concessions of the new Democratic administration after 1933 had not allowed as late as 1937 any British industry to become a competitive threat in parts of the American market, even where British industries were able to out-compete the American producer in the world market. After 1949, however, there is evidence, as pointed out above, that the combined effect of devaluation and further substantial duty reductions from Geneva to Torquay have for the first time in this century allowed imports to be more than "supplementary" imports and to make occasionally competitive inroads into the domain of American producers in the United States market. But though the net effect was an increase in imports in the order of magnitude of no more than 200 million dollars, there are indications that at last in the opinion of the Tariff Commission the peril point is reached in a few industries; it may be predicted that further inroads will not be tolerated. The increase in imports will, therefore, depend on the increase in income; new imports will again be supplementary. I hope it is clear that what I call supplementary imports may compete with American products. They are supplementary because they materialize only where American capacity (measured at the level of minimum average costs) is not sufficient to satisfy demand at the corresponding normal price. In a depression, the previously supplementary imports may commence to make inroads

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of a stable marginal propensity to import raw materials based upon technological considerations. For the period for which I feel entitled to retain this hypothesis (and which is certainly much shorter than twenty-five years), I therefore cannot accept the projection of the Paley report as refutation of my function.

into the demand of the American purchasers and are then fought by tariff increases.

On the other hand, precisely because the bulk of United States imports is still supplementary and not competitive, there does not exist a strong inducement to increase the tariff wall as long as prosperity lasts. Whatever materializes in form of duty increases will affect the import volume of some manufactured goods—and possibly cheese—but the over-all effect on imports would be in the order of magnitude of less than 10 per cent.

Hence, I submit for discussion the following import function as prevailing now. The main difference between the present function and the interwar functions lies in the marginal propensity, not any longer in the constant.

TABLE 8  
UNITED STATES IMPORT FUNCTION, 1951  
THIRD APPROACH  
(Billions of 1928 Dollars)

Raw materials	.021 $Y - .33$
Food	.011 $Y - .39$
Manufactures	.006 $Y + .06$
	<hr/>
	.038 $Y - .66$

On the basis of these functions, we might estimate the level of national income at which the balance of trade will be in what we may call quasi-equilibrium. I assume here as import goal the amount of 13 billion dollars in 1951 prices—equal to the actual exports in 1951 minus 2 billion dollars special exports arising from the mutual security program or off-shore procurements in the future. In prices of 1928, the 13 billion dollars would be equivalent to 8.3 billion dollars.

I am aware of the implications which, in a free economy, increasing exports of the "rest of the world" to the United States must have for the income and the imports of the foreign countries, and, therefore, also for the exports of the United States. But I assume that by controls of any kind the foreign countries imports will be stabilized approximately on the level of 1951, excepting only the effect of an increase in population and the armament imports from the United States already mentioned. Then our equation leads to a level of national income of 201 billion dollars in prices of 1928, or about 331 billion dollars in prices of 1951. This would be only 20 per cent above the income level of 1951. If prosperity lasts, the level of 331 billion dollars national income can be expected to be reached within no more than five years. And if we allow for an annual increase in world imports from the United States by 1 per cent to take care of the population increase, it should not take more than seven years to obtain quasi-equilibrium in the United States balance of trade.

## A STRUCTURAL APPROACH TO THE PROBLEM OF IMPORT DEMAND<sup>1</sup>

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### I

I propose, in this paper, to re-examine the problem of estimating import demand functions for the United States. To my mind, the most critical (and also most neglected) aspect of this problem is the choice of an appropriate estimating technique. I believe I can show that some elementary "structural" facts load the dice against the traditional least-squares method, and strongly suggest a new, alternative technique. Furthermore, the new technique, when applied, yields results far different from those we have been accustomed to getting. Whereas past results have led us to assume the price elasticity of United States import demands to be between 0 and  $-1$ , my work suggests that elasticities of  $-2$  and even  $-3$  are at least equally consistent with our experience.

My results are important, I feel, for the light which they shed on the postwar controversy over whether price elasticities in international trade are generally low or high. In this debate, the weight of empirical analysis has all been on the low-elasticity side; members of the high-elasticity school have heretofore been forced to argue solely from broad, qualitative presumptions. Moreover, with the empirical estimates in hand, some low-elasticity people have moved on to question even the possibility of a stable price equilibrium in international trade and have advocated discriminatory and restrictive policies which would be at best unnecessary and at worst downright detrimental if in fact the elasticities were high. My results tend to knock the empirical props out from under these recommendations of the low-elasticity school and lend support to trade policies that rely firmly on the free price mechanism.

Since my argument proceeds from the "first principles" of estimation, I shall start with a simple supply-and-demand example, in which

<sup>1</sup> The general subject of this paper has been a matter of interest to me for some time, and my debts to others are correspondingly great. I am grateful to the Cowles Commission for Research in Economics, under whose auspices I first started my work on import demand, to the Social Science Research Council for its generous support, and to the members of the Cowles Commission Staff and of the economics seminar at Johns Hopkins for helpful comments and suggestions. I am particularly indebted to Carl Christ, Clifford Hildreth, and T. C. Koopmans for their long-standing interest in the econometric aspects of my work, and to Faye M. Goldware for her aid in the preparation of this paper. This paper will be reprinted as Cowles Commission Paper, New Series, No. 73.

the objective is to estimate a demand curve from four points observed at different times (Figure 1). Each point is presumed to represent the equilibrium of supply and demand for its particular time; hence it is clear that the demand curve must have shifted over the period of observation. But once the possibility (or necessity) of a shifting demand curve is recognized by the estimator, a Pandora's box of frightful possibilities is opened. For now it must be granted that the observed points could have come from a demand curve of practically zero elasticity shifting in one fashion (dashed lines), or from a demand curve of practically infinite elasticity shifting in another (solid lines), or, in fact, from a demand curve of any elasticity whatsoever. All we know is that each hypothetical elasticity (or slope) is associated with its own particular pattern of shifts in the demand curve. Clearly, the job of estimating elasticity is merely the other side of the coin from distinguishing between plausible patterns of demand shifts and implausible ones. And

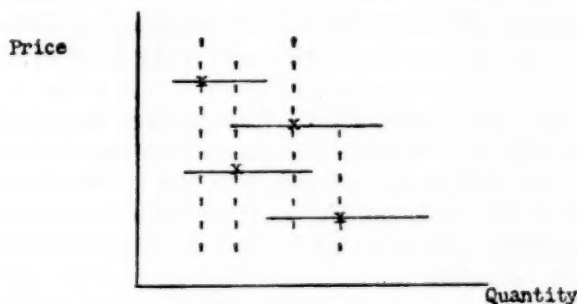


FIGURE 1

by the same token, any defensible rationale for a particular procedure of estimation must be capable of translation into a reasonable criterion for distinguishing admissible from inadmissible shift-patterns.

There are two quite distinct ways by which the least-squares procedure, which has been the basis for past estimates of United States import demand elasticity, might be defended in terms of assertions about the nature of demand shifts. On the one hand, in cases where there is reason to believe that the function to be estimated is very stable, shifting hardly at all over time, no line which fits the observed points well is likely to yield a poor estimate. Hence, in such cases, the least-squares "line of best fit" can hardly be rejected. But instances in which we can assert that our function is likely in fact to be highly stable over time are rare indeed in economics, and, I would suggest, particularly rare in the field of international trade.

We may therefore turn to the second possible justification for the

least-squares method. It can be shown that least-squares yields correct estimates if the shifts in the function to be estimated are, over time, uncorrelated with changes in the variables treated as "independent" in regression. It may be surprising but it is nevertheless mathematically true that in our example the simple assumption of noncorrelation between demand shifts and changes in price reduces the possible values of the price elasticity from an infinite range to a single point. An assumption which, to the unpracticed eye, may seem to be a plausible approximation, acceptable on grounds of convenience in the absence of an obvious alternative, thus turns out to have tremendous empirical content. Clearly, we can be no more sure of the elasticity estimate that least-squares gives us than we are of the empirical validity of the assumption we use to get it. Yet it is hard to see, upon examination, how anybody could claim empirical validity (or even likelihood) for the assumption in question. For rightward shifts in demand tend directly to raise prices and leftward shifts to lower them. Hence we should expect a positive correlation between demand shifts and price changes and not the zero correlation which the least-squares method requires.

Thus we can justify the use of least-squares to estimate import demand functions neither on the grounds that shifts in demand are negligible in size nor on the grounds that the shifts are uncorrelated with changes in the "independent" variables. We must, it seems to me, seek an estimating scheme which is directly based on the assertions which we can plausibly make concerning the nature and effects of demand shifts. And, as a corollary to this approach, we must be prepared to accept a range of uncertainty in our estimates which corresponds to the range of unavoidable uncertainty in our assertions about demand shifts. The data themselves are fully consistent with an infinite range of price and income elasticities, and it is the estimator himself who narrows this range by the assumptions which his scheme imposes. This fact obviously warns against the use of arbitrary estimating procedures, derived from statistical cookbooks, whose implicit assumptions have not been explored and found applicable to the case at hand. It also throws considerable suspicion on techniques which yield precise estimates, or even precise estimates surrounded by normal curves of error. For we cannot afford to forget that precision of estimates quite typically merely reflects the rigidity of imposed assumptions.

## II

Since shifts in demands, though unobservable, are so important in the process of estimating, we should certainly try to define them in the most meaningful way. The usual procedure of taking regressions of



absolute quantities of imports against absolute levels of real income and relative price, defines any year's shift in demand as the difference between the position of the demand curve in that particular year and its average position over the whole period of estimation. I think we can reason much more sensibly about year-to-year shifts in demand than about such deviations from a long-period average. Therefore, in my work, I take my variables as year-to-year percentage changes rather than as absolute quantities. This alteration in procedure has little effect on the least-squares estimates of United States import demand elasticity. The least-squares estimates which I obtained, using interwar data, are shown in row I of Table 1. They do not differ greatly from past least-squares results, except where the past estimates were based on a distinctly different definition of the relative price variable.<sup>2</sup>

As indicated above, the estimates of row I might be defended either by the assertion that the import demand functions in question were highly stable over the period of estimation (1923-39) or by the assertion that the shifts in import demand in this period were uncorrelated with changes in both relative price and real income. Since it is not possible to make either assertion with any degree of confidence, I feel that the estimates must be rejected. Stability is patently inconsistent with the data (even when the extent of the annual shifts, apart from trend, in the functions is minimized, they average about 10 per cent), and the assumption of noncorrelation between demand shifts and price changes runs counter to the expectations we derive from elementary supply and demand analysis.

As a first step in the search for better estimates, I shall assume that demand shifts are positively correlated with price changes, as our theory leads us to expect. But, tentatively, I shall retain the least-squares assumption that demand shifts are uncorrelated with income changes. This simple alteration of assumptions changes drastically the inferences that can be derived from the data. Far from being the central point in a range of plausible estimates, the least-squares estimate turns out to be the absolute lower limit to such a range. Any higher price elasticity is equally consistent with the data and the assumptions just made; the upper limit to the range is minus infinity.

To further limit the range of possible values of price elasticity, we must make more restrictive assumptions. If we were prepared to say, for example, that the income elasticity of import demand were sure to

<sup>2</sup> My price variable was import price deflated by the general U. S. wholesale price index. Quite naturally, the elasticity of demand with respect to such a price variable will be lower than the elasticity with respect to import price deflated by an index of the prices of close substitutes. Some previous investigators have used the latter deflation scheme, and have come up with elasticity estimates somewhat higher than those shown in row I, but these measure an elasticity different in concept from that which has become prominent in the theory of tariffs and of exchange stability and which I am attempting to measure.

TABLE 1  
PRICE-ELASTICITY ESTIMATES FOR UNITED STATES IMPORT DEMAND

	Total Imports	Crude and Semi-manufactured Materials	Crude Foods	Manufactured Foods	Finished Manufactures
I. Least-square estimate	-1.3	-.4	-.4	-.4	-.9
II. Lower limit	-1.3	-.4	-.4	-.4	-.9
Upper limit	-6.3	-5.0	-10.8	-1.4	-5.0
III. Lower limit	-1.3	-.4	-.4	-.4	-.9
Upper limit	-3.4	-7.6	-1.9	-1.1	-3.3
Assumed income elasticity	2.3	1.9	1.0	1.0	1.4
IV. Lower limit	-1.9	-.9	-.5	-.5	-1.0
Upper limit	-3.5	-4.1	-1.9	-1.6	-3.3
Assumed income elasticity	3	2.5	1.5	.75	1.0
V. Lower limit	-2.8	-2.1	-.6	-.2	-.6
Upper limit	-4.6	-4.5	-2.3	-2.8	-4.0
Assumed income elasticity	4	4	2	1.5	2.0
VI. Lower limit	-.1	0	-.8	0	-.2
Upper limit	-45.5	-∞	-3.7	-∞	-28.6
Assumed income elasticity	1	1	3	2.5	3.0

*Assumptions:*

Least-square estimates (row I) are based on

a) assumed zero correlation of demand shifts with price changes

b) assumed zero correlation of demand shifts with income changes

Limits in row II are based on

a) assumed positive correlation of demand shifts with price changes

b) assumed zero correlation of demand shifts with income changes

c) income elasticity between .5 and 5.0

Limits in rows III-VI are based on

a) assumed positive correlation of demand shifts with price changes

b) assumed positive correlation of demand shifts with changes in quantity of imports not explained by income

c) income elasticities as shown

(The income elasticities assumed in row III are those obtained by least-squares regression.)

*Data:* Year-to-year percentage changes in imports were fitted as a linear function of year-to-year percentage changes in the relative price of imports and real gross national product. The gross national product data were the Department of Commerce Series, expressed in 1939 dollars. The price deflator for import prices was the general wholesale price index. The series on quantities and prices of imports were obtained from Adler, Schlesinger, and van Westerborg, *The Pattern of United States Import Trade Since 1923* (Federal Reserve Bank of New York, 1952), pp. 81-82. The time period was from 1923 to 1939.

lie somewhere between .5 and 5.0, then we could limit the price elasticities as shown in row II of the table.

These ranges depend very explicitly on the rather implausible assumption that demand shifts were absolutely uncorrelated with changes in income over the period of observation. We can, however, get upper

limits without saying anything about the relation between demand shifts and income. We need only assume, in addition to positive correlation between demand shifts and price changes, that some particular income elasticity applied during our period, and that the shifts in demand were positively correlated with quantities of imports unexplained by changes in income. This last assumption comes right out of our theory; for just as rightward shifts in demand tend to raise prices, they also tend to raise quantities.

It seems to me that the only possible weakness in this approach is that, at the start, one has to choose a precise income elasticity. But this is not important for our problem of getting some notion of where the price elasticity of import demand lies. For regardless of what plausible income elasticity we assume, the ranges which emerge center very far

TABLE 2  
PRICE ELASTICITY ESTIMATES FOR UNITED STATES IMPORT DEMAND

	Total Imports	Crude and Semimanufactured Materials	Crude Foodstuffs	Manufactured Foodstuffs	Finished Manufactures
Lower limit	-1.3	-.4	-.4	-.4	-.9
Upper limit	-6.3	-4.8	-2.3	-2.5	-4.8

*Assumptions:*

- a) positive partial correlation of demand shifts with price changes, income held constant
- b) standard deviation of annual demand shifts less than 20 per cent

above the traditional least-squares estimates. This can be seen in rows III-VI of the table. Each income elasticity has its own range of price-elasticity estimates, and these ranges do differ. But they are unanimous in lying overwhelmingly above the old least-squares estimates. I therefore conclude that the old estimates have given us a quite erroneous impression about the price elasticity of demand for imports.

Readers conversant with the statistical literature on estimation may notice the absence of probability statements in the above analysis, and, on reading the appendix, may wonder whether the results of my estimation procedures are thought to be independent of sample size. These apparent anomalies are simply explained. For my statements to the effect that "demand shifts are positively correlated with price changes," and like assertions, are intended to apply to the actual period of observation, not to a "population" from which the actual observations may be regarded as a sample. Naturally, the shorter the period, the more likely it is that fortuitous shifts in supply could make the actual correlation zero or negative, even though economic theory leads to a strong presumption to the contrary.

## III

A possibility exists, which we have not as yet explored, of further narrowing the ranges given in Table 1. It was shown in the example given earlier how each hypothetical elasticity was associated with a particular pattern of shifts in the demand curve. We have so far used presumptions about the effects of demand shifts on prices and quantities to exclude as implausible some of these hypothetical elasticities. In this section we shall attempt to rule out additional hypothetical elasticities, on the grounds that they imply an implausibly great shiftability of the demand function.

The difficulty of successfully applying this criterion with respect to our present problem has already been alluded to. It arises from the fact that we have no good economic grounds for supposing that the United States import demand function is highly stable over time. Hence the estimates which we can rule out on the grounds that they imply excessive shiftability in our function are likely to have been already ruled out on other grounds.

My basis for concluding that we must admit of substantial instability in United States import demand is twofold. In the first place, as indicated earlier, even when estimates are so chosen as to minimize the variability of the function, the average annual shift, even after trend is removed, turns out to be around 10 per cent. Even without special presumptions in favor of instability we would have to set the maximum conceivable variability considerably above this level, which is, after all, the minimum possible. But there are very good independent reasons for believing that our import demand is quite unstable. They arise from the fact that we produce at home great quantities of goods which are practically homogeneous with our imports. Zassenhaus and Lovasy, in a recent unpublished study, have constructed an index of domestic production of items which compete directly with our imports of crude materials and semimanufactures. In value terms, this domestic production regularly amounts to between two and four times our imports in these two categories. The picture does not change when we look at our imports of foodstuffs and finished manufactures. Items like coffee, tea, cocoa, spices, and bananas, which we do not produce domestically, are the exception rather than the rule among our imports. A good 60 per cent of our total imports have close substitutes which we produce at home in great volume.

The fact of competing home production suggests that when we go about estimating an import demand function, we should not think purely in terms of a demand curve derived directly from the theory of consumers' choice. Rather, we should view import demand as a residual—as the difference between a total demand curve and a supply curve of

competing home production. Once this approach is taken, it becomes clear that the import demand function is likely to be highly unstable. For fairly small percentage shifts in either our total demand for import-like commodities or our domestic supply of import substitutes get magnified into fairly large percentage shifts in their difference, which is import demand. With these considerations in mind, it is with some reluctance that I set my "maximum conceivable" amount of shiftability in the import demand function at an average as low as 20 per cent per year. I would certainly find it difficult to argue for a significantly lower maximum.

The imposition of this restriction has very little effect on the ranges of price elasticities derived in the preceding section. In most instances it does not help to reduce at all the upper limits which we found on the basis of other assumptions. It does, however, bring the ranges of row VI into substantial correspondence with the ranges in the rest of Table 1. The upper limits in the five columns of row VI now become, respectively,  $-3.7$ ,  $-2.7$ ,  $-2.6$ ,  $-1.7$ , and  $-4.0$ . In addition, the upper limit in row III for crude materials and semimanufactures is reduced to  $-3.4$ , and the upper limit in row V for manufactured foodstuffs is reduced to  $-2.0$ .

Restriction of the variability of import demand does, however, provide us with some additional comfort. For it is now possible to eliminate altogether the more arbitrary assumptions which were used in Table 1; that is, the assumption of zero correlation of demand shifts with income changes (used in row II) and the assumptions of specific values for income elasticity (used in rows III-VI). If we assume only that the partial correlation of demand shifts with price changes was positive (holding income constant) and that the standard deviation of demand shifts was less than 20 per cent, we can limit the admissible values of price elasticity as shown in Table 2. And it is worth while to note that even a reduction of the 20 per cent limit to 15 per cent would only slightly lower the upper limits shown. This analysis thus strongly reinforces my over-all conclusion that practically any combination of plausible assumptions about demand shifts yields ranges of price-elasticities centering far above the old least-squares estimates.

#### IV

The high price elasticities suggested by the data are also indicated by our theory, together with the fact of substantial import-competing domestic production. For if imports are to be viewed as the difference between total home demand and domestic supply of import substitutes, as shown in Figure 2, the price elasticity of import demand will be some large multiple of the component elasticities of total demand and of



domestic supply. In fact, if the home demand and supply curves are each of unit elasticity, the elasticity of import demand will be  $-19$  if imports are a tenth of total demand,  $-9$  if imports are a fifth, and  $-5$  if imports are a third of total demand.<sup>3</sup> Thus the fact of competing home production by itself practically implies the high price elasticities that we find when we use a defensible technique of estimation.

The fact of competing domestic production may also have some implications about the income elasticity of import demand. On the surface it looks as if this income elasticity will also be high. For if income affects total home demand but not domestic supply, a 1 per cent rise in income will cause the home demand curve to shift to the right by a percentage equal to the income elasticity of home demand. And if the home supply curve does not shift, this will entail a magnified percentage shift in import demand.

But what about the home supply curve? It seems to me that in periods of high employment growth, like the middle and late twenties,

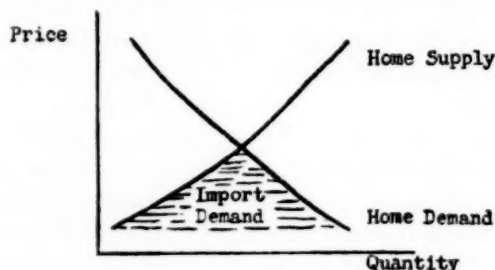


FIGURE 2

changes in real income merely reflect the aggregate shift to the right of all the supply curves in the economy, stemming from increases in labor force and productivity. I can find no reason to expect that import competing industries will not typically share in this general advance. So for periods of high employment growth, we have both total demand and domestic supply shifting to the right, and there is no reason to expect the income elasticity of import demand to be a large multiple of the income elasticity of total home demand. I come to just the opposite conclusion for periods of cyclical decline. For while income shifts the home demand curve sharply to the left in such periods, I find no reason to expect that the supply curve of import-competing goods should also shift to the left. Home suppliers should be willing to supply at least what they used to at the same relative price. They may even be prepared to supply more, owing to the availability of unemployed

<sup>3</sup> The general formula for the elasticity of import demand, where imports ( $M$ ) are the difference between total domestic demand ( $D$ ) and home supply of import-like commodities ( $S$ ), is  $\eta_M = x\eta_D + (x-1)\eta_S$ . Here  $x$  is the reciprocal of the share of imports in total home demand and all the elasticities ( $\eta$ ) are absolute values.

resources and the increases in labor productivity which a depression induces. Import demand is thus likely to be squeezed from both ends, with foreign suppliers bearing the brunt of our depression. Hence the income elasticity of import demand should be quite high in periods of cyclical decline. In periods of cyclical rise, the home supply curve is likely to advance only slowly, and I would therefore expect the income elasticity of import demand to be somewhere between its relatively low prosperity value and the high figure it is likely to reach in depressions.

The foregoing argument presents a hypothesis which, though reasonable, is as yet untested, and a thorough test of it is beyond the scope of the present paper. I have, however, made a large number of empirical experiments, designed to ascertain whether the results obtained earlier in this paper would be endangered if, in fact, the income elasticity of import demand were not a constant but varied over the cycle as my hypothesis suggests. In these experiments, I followed the same procedure I used to obtain the ranges given in rows III-VI of Table 1, but instead of imposing constant income elasticities, I used three-valued income elasticities—highest in years of cyclical decline, lowest in prosperity, and in between for years of cyclical rise. The ranges which I obtained, though slightly narrower than those shown in Tables 1 and 2, differed from them in no essential way. Without exception, the new ranges for the price elasticity of import demand, like the earlier ones, lay overwhelmingly above the old least-squares estimates.<sup>4</sup>

## V

Though the foregoing analysis establishes that the price elasticity of United States import demand is very likely to be substantially higher than was indicated by previous empirical work, it cannot claim to say the final word. The ranges obtained for price elasticity are fairly wide, and though it may not be possible to find additional plausible assumptions which narrow them significantly, some effort in this direction may be useful. More important is the fact that my ranges refer quite explicitly to the short-run (year-to-year) elasticity of import demand, while for many policy questions it is the long-run elasticity which is relevant. All we know about this important elasticity is that, because domestic supplies are more responsive to price in the long run, it exceeds the short-run elasticity which we have attempted to measure. Empirical work designed explicitly to estimate the long-run elasticity of import demand is practically nonexistent. Indeed, I doubt that it is amenable to estimation by time-series analysis of the type used in this paper. Even to approximate it will probably require a close survey of

<sup>4</sup> Further information regarding these experiments will be made available upon request.

the American economy, with a view to ascertaining the extent of each industry's vulnerability to price competition from abroad or, conversely, its ability to raid the foreigner's share of our domestic market. The key to the problem of estimating long-run elasticity lies, I feel sure, in the supply side of the supply-demand picture. It stems directly from the fact that foreign and home suppliers do compete in the American market—a fact which, as we have seen, also plays a role in the estimation of short-run elasticities.

#### APPENDIX

##### A. Limiting Procedure Used in Table 1, Row II.

The equation fitted is of the form

$$(1) \quad x_t = \alpha + \tau p_t + \varepsilon y_t + u_t,$$

where  $x_t$  is the percentage change in imports from year  $t-1$  to year  $t$ ,  $p_t$  is the percentage change in relative price,  $y_t$  the percentage change in real national income,  $\alpha$  a trend term, and  $u_t$  the percentage shift in the import demand function, apart from trend. Taking moments with respect to  $p$  and  $y$ , we obtain

$$(2) \quad M_{xp} = \tau M_{pp} + \varepsilon M_{py} + M_{up}$$

$$M_{xy} = \tau M_{py} + \varepsilon M_{yy} + M_{uy},$$

where  $M_{ij}$  designates the sum of products of the deviations from their respective means of the variables  $i$  and  $j$ , summed over the entire period of observation. The least-squares estimates are obtained by setting  $M_{up} = M_{uy} = 0$ , and solving for  $\tau$  (the price elasticity) and  $\varepsilon$  (the income elasticity). The procedure used in row II follows least-squares in setting  $M_{uy} = 0$ , but with respect to  $M_{up}$  merely asserts that it is positive. Under these assumptions, the "true" parameters  $\tilde{\tau}$  and  $\tilde{\varepsilon}$  can be expressed in terms of the least-squares estimates  $\hat{\tau}$  and  $\hat{\varepsilon}$  and an additional term. Thus

$$(3) \quad \tau = \tilde{\tau} - \frac{M_{up}M_{yy}}{\Delta}$$

$$\varepsilon = \tilde{\varepsilon} + \frac{M_{up}M_{py}}{\Delta}$$

where  $\Delta$  is the determinant ( $M_{pp}M_{yy} - M_{py}^2$ ), which is necessarily positive. Since  $M_{yy}$  is also necessarily positive and  $M_{up}$  is so by assumption,  $\tau$  (a negative number) must be greater in absolute value than  $\tilde{\tau}$ . Furthermore, admissible combinations of  $\tau$  and  $\varepsilon$  must clearly lie on the straight line

$$(4) \quad (\tau - \tilde{\tau}) = \frac{-M_{yy}}{M_{py}} (\varepsilon - \tilde{\varepsilon}),$$

which permits the translation of assumed limits on  $\varepsilon$  into derived limits on  $\tau_i$ .

B. *Limiting Procedure Used in Table 1, Rows III-VI.*

The assumption of a specific income elasticity  $\varepsilon^*$  permits the designation of a new variable  $z_t = x_t - \varepsilon^* y_t$ , which reflects the annual percentage change in imports unexplained by changes in income. The basic equation (1) can then be rewritten as

$$(5) \quad z_t = \alpha + \tau_i p_t + u_t.$$

Taking moments with  $p$ , we obtain

$$(6) \quad M_{zp} = \tau_i M_{pp} + M_{up}.$$

Since  $M_{up}$  is assumed positive, the least-squares estimate ( $M_{zp}/M_{pp}$ ) obtained from the regression of  $z$  against  $p$  is a lower limit to the set of admissible values of  $\tau_i$ .

Taking moments with  $z$ , we obtain

$$(7) \quad M_{zz} = \tau_i M_{pz} + M_{uz}.$$

Since  $M_{uz}$  is assumed positive, and  $M_{pz}$  is uniformly negative for the cases I examined, the least-squares estimate ( $M_{zz}/M_{pz}$ ) obtained from the regression of  $p$  against  $z$  provides the upper limit to the admissible values of  $\tau_i$ .

C. *Limiting Procedure Used in Table 2.*

From equations (2) we may derive

$$(8) \quad \tau_i = \tilde{\tau}_i - \frac{(M_{up}M_{yy} - M_{uy}M_{py})}{(M_{pp}M_{yy} - M_{py}^2)},$$

which in turn may be reduced to

$$(9) \quad \tau_i = \tilde{\tau}_i - \frac{\sigma_u}{\sigma_p} \left[ \frac{r_{up} - r_{uy}r_{py}}{1 - r_{py}^2} \right]$$

The partial correlation of demand shifts with price changes can be written

$$(10) \quad r_{up.y} = \frac{r_{up} - r_{uy}r_{py}}{(1 - r_{py}^2)^{1/2}(1 - r_{uy}^2)^{1/2}}.$$

Since  $r_{up.y}$  is assumed positive, it must lie between 0 and 1. Hence the bracketed expression in (9) must lie between 0 and  $[1/(1 - r_{py}^2)^{1/2}]$ ,

and  $\tau_i$  must lie between  $\tilde{\tau}_i$  and  $\tilde{\tau}_i - \frac{\sigma_u}{\sigma_p(1 - r_{py}^2)^{1/2}}$ . The assumption

of a specific value for  $\sigma_u$  completes the limiting procedure used in Table 2.

## DISCUSSION

JOHN H. ADLER: The most convenient point of departure for comments on the two papers on the United States import demand is the contrast in their over-all conclusions: Professor Harberger has made it very plain that in his opinion the many previous attempts to explain the behavior of American imports from the demand side have failed and that they were condemned to failure by sloppy reasoning.<sup>1</sup> Professor Neisser, on the other hand, implies that such shopworn statistical methods as multiple correlations produce, by and large, acceptable explanations. But further than that, he *volens volens* discovers that some of the estimating equations derived from interwar data give surprisingly accurate forecasts for the postwar period, or, at least, for some commodity classes in some postwar years.

This contrast is the more surprising since many of the analytical and statistical issues raised in the two papers are the same. Therefore, it may be appropriate to comment on some of these issues and then to attempt to arbitrate—if this is the word—the conflicting views.

Both Mr. Neisser and Mr. Harberger have pointed out the difference between the consumption function and the import function and that imports are the difference between total demand and domestic supply. But while Mr. Neisser indicates that this proposition does not, for obvious reasons, provide any additional clues to the practical problem of appraising import demand, Mr. Harberger introduces a curiously mercantilistic twist into the discussion. In his exposition, imports play a peculiar marginal role: imports are called in for assistance only if and when total demand cannot be readily satisfied by domestic output. The result is a high volatility of imports near the full employment level, and a squeeze play on foreign producers when domestic resources are unemployed.

I submit that Mr. Harberger is actually dealing with the limiting case at one end of the range of possibilities. Unless some empirical evidence is provided in support of his case, it is neither more nor less important than the opposite case in which the domestic producers are the marginal suppliers of articles directly and indirectly competing with imports. In such a situation, domestic production would be forthcoming only when the supply of imports shows insufficient response to domestic demand, and we would be faced with a peculiar sort of acceleration during, or near the peak of, a cyclical upswing. Within these two limits innumerable combinations of income elasticities of domestic production and import are, of course, possible. Perhaps the most interesting is the one in which shifts in the total demand are absorbed in the same proportions by domestic production and imports. Such a market-sharing constellation is not unlikely if a large proportion of domestic and foreign

<sup>1</sup> The comments are based on an earlier draft of Mr. Harberger's paper which he circulated before the annual meeting. In the meantime, he has made further revisions. As a result, my references and quotations may no longer be literally correct—although his basic thesis, and my objections to it, remain unchanged.



sources of supplies is controlled by identical ownership interests—as in the case of petroleum, some nonferrous metals, and other commodities. Under conditions of common ownership, it is likely to be advantageous to spread cut-backs and expansions of operations among domestic and foreign facilities. In some instances, the proportionate distribution of production shifts among domestic and foreign facilities may be dictated by long-run cost considerations; in other cases, political or public relations considerations may cause such a policy. The Congressional hearings of 1932 on the copper and oil tariff are rather enlightening in this respect. The study by Mr. Zassenhaus, to which reference has been made, shows virtually no difference between the income elasticity of the demand for imports and competing domestic commodities in the postwar period and a surprisingly small difference—.81 for imports and .68 for domestic production—for the interwar period. Parenthetically, I may add that many of the competing commodities are in reality not nearly as homogeneous as their statistical classification would indicate; e.g., oil.

All this is not to say that Professor Harberger's limiting case is unimportant. The Neisser-Modigliani study quite properly introduces the domestic supply of foodstuffs as an independent variable in the estimating equation for food imports, and the Federal Reserve study, for which I share responsibility, takes explicit account of the abnormal domestic supply situation of the drought years of the thirties and thus shows the marginal character of "emergency" imports. The experience of the war and immediate postwar period, on the other hand, provides us with examples of the marginal domestic production of certain manufactured goods such as toys or gloves. The very existence of sizable protected industries indicates that the marginal producers and suppliers are not necessarily all abroad. It is quite conceivable that in the absence of tariff changes or the increasing protection which specific duties afford during a period of low prices, the price and income elasticities of competing domestic products are high while the corresponding parameters for imports are low.

Mr. Harberger's observations regarding the interplay of domestic production and the demand for imports are nevertheless important because they show the limitations of the concept of the marginal propensity to import. These limitations are probably less important for the United States than for any other country. The behavior of Western European imports in the postwar period, for instance, can only be explained by the interaction of the import-income function and the import-domestic supply function. The problem there is further complicated by the substantial import content of exports. The relationship between the demand for imports and the volume and composition of domestic production is also a problem of acute practical significance for underdeveloped areas where the relative importance of shifts in the demand for imports through increased domestic production and of movements along the import-income functions resulting from a rise in income is of vital importance for the formulation of economic policy and policy advice. It offers a beckoning frontier for empirical investigations.

The logical consequence of Mr. Harberger's emphasis of the role of domestic output—as distinct from income—as a determinant of the level of the

import demand is his conclusion that the income elasticity of the demand for imports is a highly variable parameter, moving up and down with the cycle. For the same reasons which I presented above, I am not at all certain that he has made a convincing case for his proposition. I believe, however, that his case can be strengthened by calling on the movement of inventories and inventory policies as an additional explanatory variable. The Zassenhaus study offers rather strong evidence for the importance of inventory accumulation and decumulation as determinants of the import demand for raw materials in the short run, and I believe that the proposition can be generalized to make it applicable to foodstuffs and finished manufacturers as well. Unfortunately, I am not certain that the effects of inventory accumulations and decumulations are relevant for Mr. Harberger's model since he has conspicuously failed to "time" his elasticities. Space limitations do not allow me to elaborate on this point and I can make only a passing reference to the Federal Reserve study in which we presented a more detailed discussion of the "time dimension" of the elasticities of the American import demand derived from annual data. It may well be that the statistical results of computations based on annual data are an average of the various elasticities of different phases of a cycle and that the income elasticity is highest around the upper turning point and lower during periods of underemployment. But I hesitate to accept this proposition merely on theoretical and plausibility grounds, but rather look for some inductive evidence—which, I concede, is difficult to get.

The problem of timing the elasticities, however, raises a more fundamental question. At any given point in time, different and opposing forces are at work to shape the demand for U. S. imports. The shorter the period under investigation, the greater the importance of any one of these forces. Expectations, market appraisals, and the pattern of action and reaction of producers and traders of any commodity are likely to change swiftly, not to speak of the erratic behavior of consumers, particularly in the short run, which has recently shattered the hopeful belief in the stability of the consumption function. Therefore, it is rather doubtful whether the measurements pertaining to very short periods really are a reliable basis for projections and, what is more important, for the formulation of policies. This is not only a question of the adequacy of statistical techniques, but also one of substance and analysis. On balance, it seems to me that the measurements of the average elasticities of a period of one or two cycles, with all their shortcomings, are more reliable than those of short movements up or down or around a turning point.

This brings me to another point. Can one accept Mr. Harberger's conclusions that "we must reject the old results" and "that the well-worked data of the interwar period . . . actually give us good reason to believe that the price elasticities are quite high"? The answer, I am afraid, is in the negative for crude food and raw materials imports, while in the case of finished manufactures and foodstuffs the old results do not materially differ from Mr. Harberger's upper limits. I recognize the theoretical validity and the statistical ingenuity of Mr. Harberger's setting of upper and lower limits. But I cannot avoid the impression that for numerous institutional reasons similar to those given above and because of market imperfections of a geographic and institu-

tional nature, the "true" elasticities are very close to the lower limits, i.e., to the results of the least-square derivations, if we mean by elasticities those parameters which reflect not only initial impulses but also the complicated action-reaction pattern of price setting between importers and competing domestic producers of homogeneous, near homogeneous, and heterogeneous commodities.

My final remark pertains to Mr. Harberger's concluding observation about the need to explore long-run trends and structural problems, which ties in with Mr. Neisser's concern about the applicability or inapplicability of interwar parameters to the postwar periods. This problem has a technical and a common-sense aspect. On the technical side, I see no overriding reason to reject the slopes of the import-income and import-price functions unless the composition of imports has drastically changed. The common-sense aspect of the problem begins when we want to determine whether or not a drastic change in the commodity composition, or in the "content" of the independent variables, has occurred. In the Federal Reserve study we tried to distinguish between "systematic" and "nonsystematic" changes. We found it useful to label as nonsystematic such unique and major events as the repeal of prohibition, the drought, the development of synthetic rubber and of nylon. If the impact of such events can be quantitatively assessed—as I believe it can—and the prewar parameters are accordingly corrected, we may still obtain reasonable forecasts. But for long-run projections we clearly need a better insight into the dynamic aspects of the structure of the American economy and some basic notion about foreign supply elasticities, which at the moment are anybody's guess.

HERBERT K. ZASSENHAUS: To the series of numerical results of the two papers I have very little to add. Professor Neisser's ill luck in estimating postwar imports from his prewar import function is not really surprising. There is reason to believe that his results would have been considerably better if he had allowed for two additional variables: domestic inventories and domestic output of import-competing materials. When this is done, it appears that the correlation between domestic industrial production and domestic import-competing output of raw materials is significantly higher after the last war than before, so that there is a presumption of increased postwar substitution of domestic for imported raw materials; and that, using quarterly data, the import explanation is further improved when the ratio between raw materials inventories to manufacturing production, lagged by one quarter, is introduced as another variable. The two additions should serve to eliminate especially Professor Neisser's 1950-51 discrepancies (see his Table 5).

Professor Harberger's most interesting paper presents, in effect, the first significant step beyond the well-known contribution of Professor Orcutt to this subject. After this latter, the matter had stood as follows. What interferes with the accuracy of least-square price elasticity estimates is the shift over time of the import-price schedule. In the general case when imports are expressed as dependent on (relative) prices, domestic income, and a residual disturbance, Orcutt showed that least-squares estimates of the import-price elasticity of

this function yield a minimum value, provided there is zero correlation between the disturbance and income, and a positive correlation between the disturbance and price.<sup>1</sup> At the same time, least-squares lead to a minimum estimate also for the income elasticity when the correlation between price and income is positive but to a maximum estimate when this correlation is negative.

Now, starting from what may be called the Pareto principle of import demand—i.e., that this demand, at any price or income level, is the residual between total domestic demand and domestic import-competing supply—Professor Harberger argues as follows. The major reason for shifts in the import-price function—which analytically are registered by the movement of the residual disturbance in the Orcutt-Harberger import function—is the shift of domestic competing supply. These shifts are related to both changes in domestic income (or gross national product) and changes of the level of domestic employment (of all resources). This, in fact, is an assumption alternative to the second Orcutt condition for the minimum character of least-squares price elasticity estimate. As to the first Orcutt condition, Professor Harberger argues quite rightly that a positive correlation between prices and the disturbance variable of the import function follows already purely analytically from the Pareto principle. We end up, therefore, with the conclusion that least-squares estimates need not yield a minimum for the price elasticity; least-squares estimates of the income elasticity may, as before, be correct.

Professor Harberger therefore proceeds next to substitute a new method of estimating both extremes. It is based on three assumptions: that the income elasticity is imposed externally on the lines just described, that the residual disturbance of the import function is positively correlated with (relative) import price, and that that part of import quantity variations which is not explained by income changes is positively correlated to the residual disturbance and was found to be negatively correlated to import price.

The third assumption means, in effect, that income-unexplained import variations occur in the same direction as the disturbances in the import function, i.e., are due presumably in the main to shifts of import-competing domestic supply, and that they show direction opposite to the variations in (relative) import price.

But the behavior of domestic import-competing output plays its major role in supplying a pattern for the first assumption. For Professor Harberger proceeds now to argue that the income elasticity of imports must be expected to be "lowest in periods of sustained high employment, highest in periods of cyclical decline, and at an intermediate level in periods of cyclical rise." Whether this is so is essentially a matter of fact, and Professor Harberger's factual basis consists essentially of the known cyclical movements of labor productivity.<sup>2</sup> His analytical scheme (see third assumption) demands only that whatever income elasticities be imposed on it externally must be such that

<sup>1</sup> The influence of errors of observation is neglected throughout in the Harberger, though not in the Orcutt, paper.

<sup>2</sup> Professor Harberger is, of course, at liberty to assume that the least-squares estimate of the income elasticity is correct only so long as this assumption does not, together with the second and third assumptions, lead to either a positive or a negative correlation between income and prices.



the larger the disturbance (whose variation, as we saw, is to reflect the effects of the externally imposed shifts in the income elasticity) the less adequate income changes are to explain it, and that price decreases increase and price increases decrease the size of the disturbance. These restraints do not render his assertions on the behavior of the income elasticity over the cycle invalid. For if it is correct that it is the domestic-import substitution which is the crux of the behavior of the income elasticity of imports, it is also correct that price movements may mitigate this substitution and that it does not depend on income changes alone.

I can contribute only little to an attempt at testing Professor Harberger's first assumption. From an as yet unpublished study of quarterly imports of raw materials for 1928-38 and 1946-52 which was prepared in the International Monetary Fund by Miss Lovasy and myself—and referred to in the other papers of the present discussion—the following conclusions, with all due qualifications necessary from statistical data and methods used, emerge.

During a high-employment boom—1928-29—domestic import-competing output<sup>3</sup> failed to keep step with domestic raw material absorbing manufacturing production. The result is that imports and this production move in close step, implying an income elasticity close to unity. On the other hand, during the low-level employment boom in 1935-37 and the subsequent recession, domestic import-competing output moved much more closely together with manufacturing production, implying a relatively small income elasticity of imports for the years of rising domestic activity and a very large elasticity for the 1937-38 drop. At the same time, while imports for the whole period 1928-39 showed a falling trend ( $-0.68$ ), domestic import-competing output showed a rising trend ( $+0.29$ ). The interwar record thus yields some evidence of over-all domestic-for-import substitution,<sup>4</sup> for an intermediate income elasticity in a high-employment boom, for a low elasticity in low-employment income rises, and for a very high elasticity in low-employment income declines. This is at variance with Professor Harberger's first assumption, and it would seem to me that especially the apparent irreversibility of the substitution at low levels of employment, leading to an asymmetrical income elasticity, is significant. On the other hand, the postwar results are disappointing. As Dr. Adler has already said, the income elasticity for imports differs on the whole insignificantly from that for import-competing output. Inventory fluctuations were far more influential in explaining quarterly import changes. But, probably as the result of greatly increased output capacity during the last war, the importance of import-competing domestic materials relative to imports had greatly increased over what it was in the interwar years.

While I think that Professor Harberger's stress on import-competing domestic output, or rather on its special behavior (it is the merit of the Pareto principle to introduce it explicitly), is extremely important, I am not certain on what results follow for the price elasticity of imports. It is true that, on

<sup>3</sup> An uncomfortably large part of the index used for this output consists of crude petroleum, and Mr. Adler has already indicated that this fact calls for caution in drawing our conclusions.

<sup>4</sup> The resulting income elasticity (after eliminating the trend influences) was 0.81 for imports compared to only 0.68 for domestic import-competing output.



general grounds, the introduction of domestic-import substitution should increase these elasticities; and so it does in his scheme. But the behavior of this substitution over time should, I should guess, have in fact rather the opposite effect, especially its irreversibility—except perhaps for quite short-run price changes. And on this point, I think there was some evidence in the Harberger paper—and even in Dr. Adler's remarks—that we may not be as far from agreement as it might seem. Moreover, I feel that what factual evidence there is would tell even more in favor of the elasticity-diminishing effects on import price elasticities (for income elasticities the matter seems to be clearer in any case) if the position of several major import commodities and the relevant domestic industries is subjected to closer inspection. One very broad conclusion from Professor Harberger's paper certainly is that we do not know much about a matter of which we now know that it is very important for us to know much more! To Professor Harberger's final remarks I cannot therefore but give the fullest support.

# INTERREGIONAL ANALYSIS AND REGIONAL DEVELOPMENT

## REGIONAL COMMODITY BALANCES AND INTERREGIONAL COMMODITY FLOWS<sup>1</sup>

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This paper has two objectives: to discuss the virtues and limitations of certain operations and results already achieved in interregional and regional input-output analysis; and to indicate some of the directions along which exploratory research is now proceeding and tentatively to evaluate its significance.

### I

First, consider the operations and results associated with the derivation of commodity balances by regions. In doing this, let us illustrate with the 1947 data for New England.

The initial step in deriving regional commodity balances is to obtain and, where necessary, estimate the value of output for each industrial sector in each region.<sup>2</sup> Such data for New England are recorded in column 52 of Table 1. The second step is to multiply the dollar value of each industrial sector in a given region by the national input coefficients relating to each sector. These coefficients indicate for the nation as a whole the average cents' worth of inputs from each industrial sector per dollar value of output of any given industrial sector. The multiplication yields for any given industrial sector of the region, the estimated total input requirements from other sectors which are necessary to support the level of output of that sector in the region. Hence, in the case of New England, by multiplying \$921,525,000 (which represents the level of agricultural and fishery output of New England in 1947—see row 1, column 52) by the national coefficients indicating the cents' worth of inputs from every industrial sector per dollar's worth of agriculture and fisheries in 1947,<sup>3</sup> we obtain column 1 which

<sup>1</sup> The author is indebted to George Hall, Mrs. Fay Greenwald, and in particular to Robert A. Kavesh for invaluable statistical assistance.

<sup>2</sup> On procedure, see W. Leontief *et al.*, *Studies in the Structure of the American Economy* (New York, 1952), pp. 123-128; and forthcoming manuscript of the Harvard Economic Research Project.

<sup>3</sup> Most of the national input coefficients used are listed in Table 5 of W. D. Evans and M. Hoffenberg, "The Interindustry Relations Study for 1947," *Review of Economics and Statistics*, May, 1952. This study also discusses various problems in isolating and estimating interindustry flows and in deriving coefficients.

Throughout our paper we generally follow the 50-industry classification in the above study. The few important changes which are made are noted below.

TABLE 1 - NEW ENGLAND: INPUT REQUIREMENTS AND COMMODITY BALANCES, 1947,  
ESTIMATED FROM NATIONAL COEFFICIENTS \*

	NEW ENGLAND INDUSTRY PURCHASING																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	AGRICULTURE & FISHERIES	FOOD & KINDRED PRODUCTS	TOBACCO MANUFACTURES	TEXTILE MILL PRODUCTS	APPAREL	LUMBER & WOOD PRODUCTS	FURNITURE & FIXTURES	PAPER & ALLIED PRODUCTS	PRINTING & PUBLISHING	CHEMICALS	PRODUCTS OF PETROLEUM	RUBBER PRODUCTS	LEATHER & LEATHER PRODUCTS	STONE, CLAY, & GLASS PRODUCTS	IRON & STEEL	NONFERROUS METALS	PLUMBING & HEATING SUPPLIES	FABRICATED STRUCTURAL METAL PROD.
1 AGRICULTURE & FISHERIES	244.5	534.2	7.6	571.2	12	83	—	12	—	579	—	—	143	—	10	—	—	—
2 FOOD & KINDRED PRODUCTS	536	174.3	0.1	16.5	0.6	—	—	—	—	328	—	—	129.7	0.1	0.1	—	—	—
3 TOBACCO MANUFACTURES	—	—	81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4 TEXTILE MILL PRODUCTS	14	0.1	—	350	246.0	0.1	154	5.9	16	0.8	—	—	682	25.7	16	—	—	—
5 APPAREL	10	72	—	—	124.4	—	0.3	2.8	—	14	—	—	—	0.6	0.1	—	—	—
6 LUMBER & WOOD PRODUCTS	3.3	2.9	0.2	45	0.1	472	20.6	36.8	0.1	2.2	0.1	—	—	50	0.6	16	2.6	14
7 FURNITURE & FIXTURES	—	—	—	—	—	—	0.4	0.7	—	—	—	—	—	—	—	—	—	—
8 PAPER & ALLIED PRODUCTS	7	16.1	0.6	214	16	0.2	0.8	358.0	70.3	15.8	14	3.1	158	8.9	—	—	—	0.5
9 PRINTING & PUBLISHING	—	14	—	0.6	—	—	—	—	—	496	0.8	—	—	—	—	—	—	0.1
10 CHEMICALS	18.7	51.5	0.2	219.8	9.0	1.1	34	25.2	6.3	127.0	2.6	94	36.8	5.7	4.5	7.9	1.3	0.6
11 PRODUCTS OF PETROLEUM & COAL	10.3	2.1	—	8.2	0.3	3.2	0.1	8.7	0.2	15.5	59.0	1.9	0.6	2.5	38.3	4.6	0.4	0.1
12 RUBBER PRODUCTS	2.7	0.3	—	3.6	1.1	0.4	0.3	1.2	0.2	—	—	—	—	64	14.6	0.4	—	0.1
13 LEATHER & LEATHER PRODUCTS	—	—	—	0.6	3.4	0.2	0.4	—	0.3	—	—	—	—	302.9	—	—	—	—
14 STONE, CLAY & GLASS PRODUCTS	1.5	9.0	—	0.3	—	0.6	1.8	3.9	—	12.3	0.6	1.1	15	21.2	8.1	3.1	0.5	0.2
15 IRON & STEEL	0.1	0.1	—	—	0.1	0.4	5.2	—	—	0.2	0.1	2.2	0.3	1.1	180.1	3.1	10.4	17.0
16 NONFERROUS METALS	—	—	—	—	—	0.1	0.9	—	0.9	9.0	—	—	—	0.6	14.7	241.7	5.7	1.9
17 PLUMBING & HEATING SUPPLIES	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18 FABRICATED STRUCTURAL METAL PROD.	—	—	—	—	—	—	0.3	—	—	—	—	—	—	—	—	0.7	—	2.4
19 OTHER FABRICATED METAL PRODUCTS	1.9	19.3	0.1	—	—	0.4	1.5	7.1	2.3	0.1	6.2	1.0	1.9	4.7	0.2	1.1	0.4	4.4
20 AGRICULT., MINING & CONST. MACHINERY	1.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.7	0.7
21 METALWORKING MACHINERY	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.4	0.7
22 OTHER MACHINERY (except electric)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.1	0.4
23 MOTORS & GENERATORS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.1
24 RADIOS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.1
25 OTHER ELECTRICAL MACHINERY	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26 MOTOR VEHICLES	2.5	0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27 OTHER TRANSPORTATION EQUIPMENT	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28 PROFESSIONAL & SCIENTIFIC EQUIP.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29 MISCELLANEOUS MANUFACTURING	0.1	0.4	—	1.1	16.2	—	0.9	2.1	—	14	—	—	—	—	—	—	—	—
30 COAL, GAS, & ELECTRIC POWER	14	6.9	—	288	2.3	1.0	1.0	17.0	1.9	9.0	6.8	5.8	44	10.1	10.9	9.7	0.8	0.5
31 RAILROAD TRANSPORTATION	9.9	19.5	0.2	258	3.8	6.2	2.9	30.8	4.4	13.7	3.3	5.6	10.5	7.2	19.1	9.3	1.2	1.1
32 OCEAN TRANSPORTATION	1.6	4.5	—	36	0.7	0.4	—	2.2	—	2.1	1.1	—	—	—	—	—	—	—
33 OTHER TRANSPORTATION	12.5	13.0	0.2	21.7	1.6	6.0	2.2	16.1	1.8	4.5	5.7	1.1	6.1	3.5	6.3	1.8	0.4	0.2
34 TRADE	30.6	14.8	0.4	62.4	23.4	2.6	3.2	24.3	2.0	6.3	0.2	8.6	16.7	2.6	9.8	13.0	2.2	1.7
35 COMMUNICATIONS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
36 FINANCE & INSURANCE	54	5.1	—	5.5	1.5	3.3	1.0	2.5	1.5	0.9	1.5	1.1	2.0	2.3	2.0	1.3	0.4	0.4
37 RENTAL	53.9	3.2	—	6.9	6.1	0.8	0.9	3.6	4.0	1.6	—	—	1.6	5.6	0.9	1.6	2.0	0.2
38 BUSINESS SERVICES	0.2	18.9	1.0	19.5	6.1	0.8	3.1	3.0	3.8	20.3	0.5	3.3	14.3	0.5	1.1	0.5	1.0	0.3
39 PERSONAL & REPAIR SERVICES	8.3	4.2	—	0.8	0.2	1.8	0.2	0.8	1.3	0.5	0.2	0.2	0.3	1.5	0.1	0.3	0.1	0.1
40 MEDICAL, EDUC. & NONPROFIT ORG'S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41 AMUSEMENTS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
42 SCRAP & MISCELLANEOUS INDUSTRIES	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43 UNDISTRIBUTED	—	73.1	1.3	120.3	93.0	38.0	17.7	27.7	39.6	93.2	9.6	51.2	94.4	28.1	13.0	9.4	12.8	5.3
44 EATING AND DRINKING PLACES	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
45 NEW CONSTRUCTION AND MAINTENANCE	4.5	4.2	—	10	1.0	0.5	0.4	5.8	1.0	1.7	0.3	1.1	5.6	1.7	3.7	1.9	0.3	0.2
46 GOVERNMENT	18.3	40.3	1.0	175.6	23.8	14.6	6.0	68.5	21.8	36.5	9.5	17.8	39.7	15.9	25.9	22.8	5.2	3.5
49 HOUSEHOLDS **	431.7	222.3	3.8	902.8	254.3	110.6	57.3	297.9	197.2	164.1	59.9	69.5	333.0	111.3	178.4	141.3	37.9	28.9
TOTAL GROSS OUTLAYS	921.5	1250.7	25.0	262.3	614.6	281.1	154	599.4	416.8	636.9	163.8	439.2	1093.1	231.8	555.5	531.2	106.0	71.0

\* All figures in Millions of Dollars. The data are preliminary and subject to rounding errors.

\* Asterisk denotes entry where corresponding entry in the national interindustry flow table is less than \$0.5 million.

+ Dagger denotes entry of less than \$50,000.

\*\* Minus sign represents inventory depletion; plus, inventory accumulation.

+ Minus sign represents deficit; plus, surplus.

\*\* Household row includes depreciation and other capital consumption allowances.

NEW ENGLAND INDUSTRY PURCHASING

represents estimates of input requirements by industrial sector into the New England agriculture and fisheries industry in 1947. Similarly, by multiplying \$1,250,697,000 (the value of New England's output of food and kindred products) by the relevant national input coefficients we obtain column 2; namely, the estimated input requirements of New England's food and kindred products industry in 1947. In like manner, columns 3 to 45 were obtained, each indicating the estimated input

UNITED STATES INDUSTRY PRODUCING

A stern warning is now in order. These input requirements are merely crude estimates. For example, take the estimated input requirements into any region's agricultural sector. They deviate from the actual on at least two major counts. One, agricultural practices differ signifi-



cantly from region to region. Farmers in one region may use more labor and less machinery than in another. As a consequence, their actual labor requirements will tend to be higher than the figure obtained by multiplying the value of their output by the coefficient indicating the cents' worth of labor per dollar value of agriculture for the nation as a whole. Two, the composition of agricultural output in the diverse regions differs. Regions tend to specialize along certain lines. We know that different lines of agricultural production tend to require different sets of inputs, at least to a limited extent. Hence, per dollar value of agricultural output regional input requirements will differ from one another simply because of difference in composition of agricultural output. Thus, on this second score, too, the above computed input requirements of a region's agricultural sector, which are based on the assumption that the character of agriculture is the same from one region to the next, will differ from actual.<sup>4</sup>

The third step in deriving regional commodity balances is to determine the extent to which each region is responsible for the bill of goods (final demand) sector. More concretely, we must specify for 1947: the change in the inventory of the product of each industrial sector which each region holds; the dollar value of each product which each region utilizes in furnishing and being furnished the diverse governmental services it requires; the amount of the product of each industrial sector absorbed in the process of building up the gross capital stock of each region; and the dollar value of each product which the households of each region consume.<sup>5</sup> In the case of New England we have crudely

<sup>4</sup> It was for these reasons, in addition to the poorer quality of the 1939 interindustry flow data which would have made still more precarious the derived data on input requirements by industrial sector for each state, that our tables of input requirements for each state in 1939 were reduced to a listing of input requirements by all industrial sectors as a whole and by the bill of goods sectors as a whole. See W. Leontief *et. al.*, *op. cit.*, pp. 128-133. In this connection, too, see the later study based on 1947 data by G. Freutel, "The Eighth District Balance of Trade," *Monthly Review of the Federal Reserve Bank of St. Louis*, June, 1952.

<sup>5</sup> A fifth bill of goods sector, namely, foreign countries (exports to) and the corresponding row, foreign countries (imports to), which are included in Evans and Hoffenberg, *op. cit.*, are not considered here and are omitted from Table 1. It seems more appropriate for regional analysis within the United States to view foreign countries together as an additional region, and thus to subtract imports of a particular product from foreign countries into a given region from the given region's exports of the same product to foreign countries, when the exports and imports are competitive. Emphasis should be on net exports or imports, much as in the BLS 192 interindustry flow tables. In contrast, when imports of a particular product into a given region are noncompetitive, i.e., when the product is not produced at all in the given region (such as certain food products), then there logically should be a foreign countries row where such imports should be recorded. Since competitive imports dominate noncompetitive for the entire United States and since not even a partially satisfactory technique was available to distribute noncompetitive imports (and also noncompetitive exports and net competitive imports or exports) for the United States by regions, the foreign countries row and column were omitted from the preliminary Table 1. Hence, total gross outlays and total gross output are understated at least to the extent that New England does consume noncompetitive imports and does export noncompetitive items to foreign countries, respectively, and should be viewed as net of

approximated its bill of goods sectors by assuming: that its 1947 net accumulation or decumulation of inventories of the products of any given industrial sector bore the same ratio to national net accumulation or decumulation as its 1947 output of that sector bore to national (this is in line with procedures adopted by Evans and Hoffenberg, *op. cit.*, page 108); that its governmental requirements of various products were for the most part related to the percentage of total U. S. federal employees, the percentage of total state and local government pay rolls of school and nonschool employees, the percentage of total U. S. new public construction and the percentage of total national income for which New England was responsible in 1947; that, of the amounts of various products absorbed by the gross capital formation sector for the nation as a whole, gross capital formation in New England took a share of each equal to New England's share of national new construction (Leontief, *op. cit.*, pages 129-133); and that the amount of any given product consumed by New England households was in the same proportion to national household consumption of the same product as New England's income was to national. Hence we were able to fill in the columns numbered 46, 48, 49, and 50 in Table 1. It should be reiterated that the items in these columns represent crude estimates which can and should be considerably improved with further research. They are being presented in order to complete the table and allow an evaluation of the significance of the resulting computed commodity balances.

The last step is to sum the elements in each row up to and including the element listed in column 50. In Table 1, the resulting sums are recorded in column 51. Since each element represents the 1947 requirement of the New England segment of the industrial or bill of goods sector listed at the head of the column, the sum of the elements along any row represents total New England input requirements or consumption of the product of the industrial sector corresponding to the row. Hence, column 51 records New England's consumption of each of the products of the various industrial sectors. Subtracting New England's consumption of the product of any industrial sector from her own production of the product of that industrial sector (as recorded in column 52 in the corresponding row) yields for that industrial sector a net surplus or deficit, or positive or negative commodity balance, for New England. Column 53 lists such derived commodity balances for New England, by industrial sector.

## II

Having derived regional commodity balances, we are now in a posi-

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these items. Further research must be aimed at developing adequate techniques for handling foreign imports and exports and for introducing them into Table 1.

tion to appraise briefly the significance of the resulting figures and the associated table of input requirements. It should be mentioned at the start that the table of input requirements is not a regional input-output table or a regional interindustry commodity flow table as we generally think of input-output and interindustry flow tables. Table 1 indicates New England's input requirements only from the nation as a whole and does not yield any information on the extent to which any input requirement is furnished by New England and other regions. For example, New England may produce an item X which it also consumes in the same magnitude. However, Table 1 will not tell us whether New England's output of X is absorbed by New England's industries or whether New England at least partially exports X to other regions and in turn imports X from producers outside New England to satisfy her internal needs. In contrast, a regional input-output or interindustry flow table indicates along any row the distribution of the output of any industrial sector in a given region: to every industrial sector in the same region; and to the category, regional exports, or ideally (where regional exports can be broken down by sector and region of destination) to every industrial sector in every other region.<sup>6</sup> Reading down a column in a regional input-output table yields the inputs into the industrial sector of the region listed at the head of the column: from every industrial sector in the same region; and from the category, imports from other regions, or, ideally, from every industrial sector in every other region. Clearly a regional input-output table furnishes information superior to that of a regional input requirements table and permits more penetrating analysis along lines to be discussed in the following section.

Turning to the regional commodity balances listed in column 53, one tends, a priori, to attach to them a greater significance than they deserve. Too frequently, an unsophisticated person concerned with industrial development within his region, particularly when it has unemployed labor resources, reasons as follows: Every import into my region is a drain upon the financial resources and income of my region. Column 53 of the input requirements and commodity balances table indicates the areas in which my region has deficits. These are areas, then, where production in my region should be stimulated in order to employ idle labor and simultaneously cut down on financial outflows.

And in like fashion he may also reason: Column 53, too, indicates the industries of my region which have surpluses in terms of my region's needs and hence which export to other regions. If these industries have been able to meet the competition of other regions and are able to in-

<sup>6</sup>For a full description of such a table, see W. Isard, "Interregional and Regional Input-Output Analysis: A Model of a Space-Economy," *Review of Economics and Statistics*, November, 1951, pp. 320-324.

vade their markets, these then represent the areas of strength in my region. These are areas in which production should be further encouraged.

It cannot be too strongly emphasized that a mere listing of imports and exports, or of derived surpluses and deficits, for any region gives no indication whatsoever of the types of production which ought to be expanded in that region. It may be that the very item in which a region has the greatest deficit should be imported still more. This might be desirable in order to furnish input requirements for a higher level of activity of its export industries having comparative cost advantage, or in order to supply households with more consumers' and producers' goods to achieve higher levels of labor productivity in both domestic and export industries. And, at the other extreme, the industry which exports most might be the very industry whose production should be discouraged because of its inefficient use of resources and because of falling advantage or mounting disadvantage from a comparative cost standpoint (for example, the textiles of New England). Or, it may be that imports in an industrial sector in which there is little production and consumption in a given region (and hence negligible surplus or deficit) should be greatly encouraged in order to promote new types of industries in the region which can produce at a definite cost advantage for domestic and export demand.

In short, what I am driving at is this: in the determination of the basic industries to be nurtured and promoted in a region, input requirements and commodity balances tables are of little help except as a source of statistical data. Rather, one must resort to comparative cost studies, location theory, and traditional market and regional analysis. I realize that these statements are obvious and unnecessary for most economists. I make them in order to avert as much as possible the increasing tendency to interpret regional input requirements and commodity balances tables as magical indicators of desirable industrial development programs.

I should also like to caution against attributing too much significance to the net figure derived by summing the deficits and surpluses of the several industrial sectors (at least one bill of goods sector being excluded). Some may be inclined to consider this figure a measure of a region's net trade balance on commodity account with other regions as a whole (of course, only with respect to the industrial commodities included). However, I feel that we ought to refrain from doing so. Large errors may arise: because, as mentioned above, errors already exist in the input requirement estimates from assuming identical production practices and consumption habits among regions; and because

our knowledge of each region's contributions to the various bill of goods sectors is as yet inadequate to make firm allocations.

Having exposed some of the limitations of a regional input requirements table, we might now appropriately discuss its virtues. However, I can only mention two areas of major use. First, one cannot deny that such a table represents a step forward in providing the researcher with a comprehensive structural picture of a region's economy. Second, such a table is of considerable value in measuring the impact of changes in the outputs of a region's basic industries upon the level of operations of subsidiary and service activities within the region, and in making general regional projections. (See W. Leontief *et al.*, *op. cit.*, Chapters IV and V; W. Isard, *op. cit.*; and, in particular, forthcoming manuscript.)

### III

Aside from counseling caution in the uses to which an input requirements table is put, we have emphasized certain of its limitations in order to point up the need for, and prepare the way for discussion of, additional research along interregional lines. It is clear that in regional analysis we want to know not only total input requirements but also the extent to which any input requirement of a given region is furnished by that region and each other region. Additionally, we want to know how the output of each industrial sector of a given region is tied to every industrial sector in the same region and in every other region. This is the type of data which would be contained in a regional input-output table described above. Further, if those ties which tend to be stable interregionally can be isolated from those which do not, we are in a better position to project the impact of developments in one region not only upon industrial activities within that region but also upon industrial activities in other regions.

To illustrate this, imagine that the output of certain steel fabricating activities were to increase in New England. This would involve *ceteris paribus* an increase in power consumption and power output and, in turn, coal consumption. Since New England imports coal primarily from the Pennsylvania-West Virginia-Kentucky coal fields, we then are in a position to project partially the interregional flow of coal from the region of these coalfields to New England, particularly since the input of power per unit of each of the given steel fabricating activities and the input of coal per unit of power are fairly stable. Thus we are able to trace out partially the impact of a change in New England steel fabricating activity upon mining activity in the coalfields region. The more stable are the flows of this nature, the more we can reliably project interregional repercussions.



In contrast, imagine that aluminum fabricating activities increase along the Greater New York-Baltimore industrial axis. Existing flows of aluminum ingot into the band encompassing this axis are from the Tennessee Valley area and upper New York State as well as from other regions. However, it is unlikely in a period when aluminum production taxes its existing and potential capacity in the area east of the Mississippi that new imports of aluminum ingots into the Greater New York-Baltimore industrial band will follow the existing pattern. Relatively more of the additional imports will come from the area west of the Mississippi, particularly from the Texas and Pacific Northwest regions. Hence, the interregional flow pattern of aluminum ingots is subject to modification with a change in the magnitudes of regional demands. When a change in the flow pattern cannot be anticipated through comparative cost, location, and market analysis—as when the location of new aluminum reduction facilities is dictated by extra-economic considerations—we have what may be designated as “unstable” interregional flows. The more unstable flows we confront, the less reliably can we project interregional relations. However, when comparative cost and location analysis does allow us to foresee the location of new facilities and likely changes in the interregional flow pattern, we can project as reliably as before, but with greater difficulty. The discussion of this point must be left to other manuscripts.

Elsewhere (Isard, *op. cit.*) a formal interregional input-output model has been developed which is based upon interregional commodity flows and the derivation of interareal-interindustry coefficients. These two examples illustrate in an oversimplified manner the logic of the model, which I cannot discuss here. However, I do want to expose some of the problems which arise in identifying meaningful and stable commodity flows and in approximating the magnitude of the associated coefficients.

Let us confine our attention to the interregional movements of the products of the cotton industry. In the 192 BLS industry classification, the cotton industry produces both cotton and cottonseed. When an industry puts out multiple products, study of the interregional flows of each of the products of this industry should ideally be required. Frequently, however, interregional flow data are available only for the output of the industry as a whole and not for each of its products. This necessitates recourse to typical estimating and/or averaging techniques which generally yield inferior coefficients.

Fortunately, in the case of the cotton industry, flow data are broken down in terms of both cotton and cottonseed. But if this were not the case, location theory and empirical analysis would suggest negligible interregional flow of cottonseed, as in fact exists. Obviously, some

cottonseed moves interregionally since a cottonseed oil mill on one side of a regional boundary line will consume cottonseed produced nearby on the other side of the boundary. But the amounts involved are negligible. Cottonseed oil mills, by far the dominant users of cottonseed, tend to locate in the general area of cotton and cottonseed production. Consideration of the other industries which absorb cottonseed—meat animals, dairy products, cotton (for planting), fertilizers, soybean oil mills, vegetable oil mills, n.e.c., and foreign exports—suggest little interregional movement. Hence, we could have proceeded with the assumption that the interregional flows recorded for the cotton industry as a whole were primarily flows of cotton. With or without a breakdown of the interregional flows of the cotton industry, we thus have, for example:  $I, II X_{5, 59} = 0$  and  $I, II a_{5, 59} = 0$ . Here the former mathematical equation states that the flow of product from the cotton industry (5) in Region I to the vegetable oils industry (59) in Region II is zero.<sup>7</sup> The latter equation states that the corresponding coefficient indicating the cents' worth of inputs of the products of the cotton industry of Region I required per dollar value of output of the vegetable oils industry in Region II is zero.

To derive coefficients reflecting interregional flows of cotton to industrial consumers of cotton is much more complicated. A problem generally common to the derivation of interareal-interindustry coefficients arises from the gross inadequacy of existing data on flows via the several transport media. The 1 per cent ICC sample of audited carload waybills of Class I railroads, indicating for shipments of individual commodities the state of origin and the state of termination, is the best single source of such data, although nondisclosure rules, the smallness of the sample, and rebilling and other railroad practices considerably qualify its usefulness (Carload Waybill Analyses, ICC annual statements). The Army Engineers data on water shipments by commodities into and out of each port do not specify port of origin or destination, respectively, and thus are less useful.<sup>8</sup>

The weakest link in the chain is the data on truck shipments, which are by far the scantiest of all. Accordingly, in the preliminary selection of regions with which to experiment, a major consideration was to demarcate a meaningful set of regions which at the same time would

<sup>7</sup> The vegetable oils industry includes cottonseed oil mills, linseed oil mills, soybean mills, and vegetable oil mills, n.e.c. According to the BLS study no cotton is recorded as being consumed in these mills.

<sup>8</sup> *Commercial Statistics: Water-Borne Commerce of the United States* (Department of the Army, Office of the Chief of Engineers, annual reports). However, the Army Engineers' recent work on area-to-area movements by commodities promises to overcome some of the limitations of water shipment data. See the pamphlet, *Water-Borne Commerce of the United States, Domestic Deep-Sea and Lakewise Traffic, 1950* (Board of Engineers for Rivers and Harbors, June, 1952).

tend to minimize interregional truck shipments. Since the volume of long-distance trucking is sensitive to length of haul, we have chosen to consider three major regions. This tends to yield regions which are as large as possible, subject to the restraint that the resulting model trace out the effects of changes in one region upon another, not only directly, but also indirectly via a third region.<sup>9</sup>

In the case of interregional shipments of cotton, information from experts on cotton marketing suggests negligible haul by truck in 1947, our base year, though the interregional movement of cotton by truck is on the increase particularly in the West. The Army Engineers report for 1947 total domestic movement by water of 31,623 tons of cotton in bales of which 30,928 was intraport and local; hence, interregional water shipments are also negligible. The Army Engineers, however, provide important data by ports on shipments of cotton to and from foreign countries, but once again fail to specify the region of origin and destination, respectively.

In 1947 Class I railroads accounted for practically all of the interregional cotton shipments within the United States. Unfortunately, the ICC did not commence its annual state-to-state waybill analyses until 1948. However, we do have sample data for 1939, which together with the data for 1948 and subsequent years furnish us with sufficient information to approximate the 1947 flows. The percentages in Table 2

TABLE 2  
INTERREGIONAL AND INTRAREGIONAL SUPPLY CHANNELS OF COTTON IN BALES:  
BASED ON SAMPLE SHIPMENTS OF CLASS I RAILROADS  
(in percentages)

Year	Region I from			Region II from			Region III from		
	Region I	Region II	Region III	Region I	Region II	Region III	Region I	Region II	Region III
1939	31.7	67.1	1.2	0.5	98.1	1.4	0.1	1.2	98.7
1948	22.5	74.3	3.2	1.8	85.8	12.4	0.0	0.0	100.0
1949	18.8	75.4	5.8	0.4	88.8	10.8	0.0	0.0	100.0
1950	20.4	71.4	8.2	1.7	91.6	6.7	0.0	0.0	100.0
1951	27.9	66.1	6.0	0.1	90.2	9.7	0.0	0.0	100.0

SOURCES: See text.

indicate the approximate magnitude of the several channels furnishing the cotton requirements of each region. As already observed, the extent to which the use of interregional input-output techniques can be justified depends largely upon the extent to which there is underlying sta-

\*Our preliminary Region I comprises the New England, Middle Atlantic, and South Atlantic census regions; Region II, the East North Central, West North Central, East South Central, and West South Central census regions; and Region III, the Mountain and Pacific census regions. Limitations of data, particularly of the Census of Manufactures, dictated the use of census regions as building blocks.

bility in interregional commodity flows. Is there such in the case of cotton?

In Table 2 the general pattern of supply channels is clear cut and evidences at least a certain amount of stability in most if not all directions. Aside from cotton imports from foreign countries, we find that for the years 1948-51 of the cotton terminated in Region I, 19-28 per cent came from Region I, 66-75 per cent from Region II, and 3-8 per cent from Region III.<sup>10</sup> Of cotton terminated in Region II less than 2 per cent came from Region I, 86-92 per cent from Region II, and 7-12 per cent from Region III. Of cotton terminated in Region III, all came from that region. Additionally, a somewhat similar degree of stability is found in the foreign trade data. Practically all cotton imports from foreign countries have consistently gone to Region I and formed a negligible fraction of Region I's cotton requirements; and by far the lion's share of cotton exports to foreign countries has consistently left the ports of Region II, although Region III has contributed sizably to these exports.

Caution must be exercised in the interpretation of the available data. Inadequacies of the ICC sample data have already been mentioned. They alone could account for the year-to-year variation in relative supply channels, or actually conceal still greater variation. Moreover, the fact that the cotton crops in the several regions are differentially affected by weather and other natural causes would in itself lead one to expect some short-run variation at least in relative supply channels. Further year-to-year variation is not inconsistent with stable interareal-interindustry coefficients. The cotton consuming industries in any region may obtain their cotton supplies from the several regions in different proportions because of differences in quality requirements, institutional ties, and the like. Hence differences in the rate of change of output of a region's industries can lead to percentagewise variation in cotton shipped in from the several regions.

In short, any judgment at this point on whether or not the cotton supply channels are sufficiently stable for projection purposes would be premature. More adequate data must be collected and additional research conducted. In addition, experimentation with a pilot model is called for—a model wherein the supply channels of cotton and the supply channels of other commodities exhibiting the same or smaller

<sup>10</sup> The data for 1939 are included in Table 2 in order to contrast the 1948-51 pattern with the pre-World War II pattern and to furnish some historical check on stability as well as to suggest some long-run trends in the changing relative importance of supply channels. The 1939 data, however, are not strictly comparable with the 1948-51 data. The 1939 data are based on a sample of waybills, which was taken by the Board of Investigation and Research established under the Transportation Act of 1940, and which represented only carload shipments terminated by Class I railroads during one day each month in 1939.

year-to-year variation are assumed to be stable (aside from certain trend adjustments—for example, to take account of the increasing importance of Region III as a supplier of cotton to Region I). Regional projections from such a model based on 1947 data should be compared, not only with actual data for later years, but also with regional projections by other methods now in vogue. It is only then that a substantive decision can be reached on a useful definition and characterization of a stable pattern of supply channels. Parenthetically, it should be observed that many regional projections—particularly those linked to national projections—implicitly assume stability of at least certain supply channels and in some cases assume stable patterns which deviate considerably from those for any given base year or set of base years.

I had hoped to be able to present some of the preliminary interareal-interindustry coefficients for cotton inputs. This must wait for a later paper. I wish to conclude by reiterating that our purpose is not to erect a rigid model wherein a stable pattern of supply channels must be associated with every commodity. Rather we seek to determine those sets of supply channels which do in fact tend to be generally stable. Once these are determined we hope to construct from them a structural matrix which will be useful for projection purposes given certain judgments—bill-of-goods type of judgments—on the anticipated magnitude of the relatively unstable supply channels and commodity flows.



## FUEL, POWER, AND INDUSTRIAL DEVELOPMENT IN CENTRAL CANADA<sup>1</sup>

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### I

Recent writings in the field of economic development place great emphasis on the human determinants of economic growth, such as the propensity to invest, the supply of entrepreneurship, social attitudes, and the political climate. (See, for instance, Part I of W. W. Rostow's *The Process of Economic Growth*.) This approach to the problems of economic development is fully justifiable, of course, but one does hope that its undoubted attractiveness will not lead to a neglect of the part played by such things as geography, natural resources, and technological change in the economic fortunes of different areas of the world. Much remains to be done in this latter direction. In particular, the modern economist's analysis of natural resources tends to be superficial. His uncritical assumption that technical coefficients of production are variable makes it fatally easy for him to gloss over the physical and technical limitations to production inherent in any particular resource pattern, while his representation of a region's production possibilities by a smooth "transformation" curve all too often leads to the implication that almost any resource pattern will support almost any production pattern. At times, the economic concept of "land" becomes almost as abstract and nebulous as that of "capital."

This paper is a study of energy resources and industrial development. (The word industry and its variants are used throughout this paper in the narrow sense of manufacturing activity.) It seeks to show how the availability of energy resources in Central Canada (Quebec and Ontario and more especially the St. Lawrence Lowlands portion of those provinces) has affected the region's industrial development. Our approach to this problem attempts to be analytical without being abstract. In developing the relationships between our units of study, we strive for preciseness and logical rigor; the units themselves, however, are rough aggregates defined in common-sense terms rather than simple atoms defined in the unequivocal abstractions of the logician.

<sup>1</sup> Initial research on this general topic was made possible by a Social Science Research Council Fellowship in Economic History. In preparing the present paper, I have received much helpful criticism and encouragement from Professor J. C. Weldon.

Thus our unit of space is a region, not a point in space; and a region is to be visualized as a sizable territory, such as New England or Central Canada, which has broadly homogeneous geographical and economic characteristics. Our economic unit is an "industrial structure" rather than a firm; and by an industrial structure we mean simply a manufacturing development sufficiently large and diversified to correspond to the ordinary meaning of an industrial economy. Finally, we speak in terms of availability of materials rather than supply curves of materials; we wish thereby to emphasize the gap between the position of the supply curve of a material in one region and its position in another region.

A brief description of the availability of different sources of energy in Central Canada is given in Section II of the paper. In Section III we discuss the effect of this energy situation on the composition of industry in Quebec and Ontario. Section IV comprises an analysis designed to show the relation between Central Canada's energy situation and the quantity of industry in the region. Section V summarizes the paper in terms which suggest its significance for the general field of economic development.

## II

Central Canada's energy supply is characterized by two features: a virtually complete dependence on imports for its fuels (except for a quantitatively insignificant, and declining, production of oil and natural gas in southwestern Ontario) and excellent water-power resources. This supply situation is partially reflected in the relative contributions of different energy sources to total energy consumption in Central Canada as compared with the United States, as shown in Table 1.

Ontario obtains nearly all its coal from the Eastern Appalachian area of the United States. Small quantities of coal move from Alberta to Ontario, while somewhat larger tonnages are shipped from Nova Scotia into the northern part of the province via the St. Lawrence route. Both

TABLE 1  
RELATIVE IMPORTANCE OF MAJOR SOURCES OF ENERGY IN THE ENERGY CONSUMPTION OF  
CENTRAL CANADA AND THE UNITED STATES IN 1943

	Central Canada		United States	
Fuels		62.2		95.8
Coal	52.6		54.8	
Petroleum	9.0		29.2	
Natural gas	.6		11.8	
Water power		37.8		4.2

Sources: *Report of the Royal Commission on Coal* (1946), page 379. *Historical Statistics of the United States 1789-1945*, page 155.

movements depend on Dominion Government transportation assistance. Before World War II, Quebec normally drew about two-thirds of its bituminous coal from Nova Scotia by way of the St. Lawrence River, although during the thirties most of this coal reached market only with the aid of transportation subventions paid by the federal government. Small quantities of seaborne coal from other countries, particularly Great Britain, also move up the St. Lawrence to Quebec ports.<sup>2</sup> For the remainder of its supply, the province depends almost entirely on American coal. Production difficulties in Nova Scotia during and since the recent war have reduced Maritime shipments to Quebec, and the province is now more dependent on imports from the United States than it was in the prewar years.

Quebec ranks slightly behind Ontario in the availability of coal—the premier source of energy in both provinces. American coal at Montreal is more expensive than at Ontario ports by the transportation charges through the St. Lawrence canals. Moreover, Nova Scotian coal, which is subsidized by the Dominion Government to make it competitive in price with American supplies in the Quebec market, is of inferior quality for many industrial purposes (*Carroll Commission Report*, pages 435, 488-489). Ontario, on the other hand, is fortunate in having easy access to a wide variety of quality coals from one of the lowest cost coal mining areas in the world.

In industrial development, however, Central Canada has to compete with the United States. It is important, therefore, to appreciate the handicap with respect to coal supplies which even Ontario suffers by comparison with American areas just across the Lakes. The following figures show the approximate price differentials for 1939 between coal supplies at two American lake ports and three Canadian cities—Montreal, Toronto, and Kitchener (an inland manufacturing center in Ontario). These three instances were chosen by a recent Royal Commission on Coal as being representative of major coal movements from the United States to Central Canada. The figures for the differentials, including a tariff item of 75 cents per ton, are as follows: Montreal over Rochester, \$1.58; Toronto over Cleveland, \$1.18; Kitchener over Cleveland, \$2.35 per ton.<sup>3</sup> These figures give the minimum differences

<sup>2</sup> *Report of the Royal Commission on Coal* (1946), p. 439, hereafter referred to as the *Carroll Commission Report*.

<sup>3</sup> Figures compiled from information given in the *Carroll Commission Report*, pp. 339 and 344. The Canadian tariff on bituminous coal is responsible for a large part of the total price differential. Since Central Canada, where some four-fifths of Canadian manufacturing is carried on, will continue to be dependent on imports of American coal, the tariff appears to be nothing but a mischievous hidden tax on Canadian manufacturing. Whatever the magnitude of its influence, the qualitative effect of the tariff on Central Canada can only be to retard the industrial development of the region. The tariff does, of course, have the effect of reducing the transportation assistance given by the Dominion Government to the Canadian coal industry. This assistance, dignified by the term National Coal

in the cost of coal between the two areas, but even so they represent large percentages of the price of American bituminous coal which in 1939 averaged \$1.84 per ton f.o.b. mine (*Historical Statistics of the United States, 1789-1914*, page 142).

Central Canada's other energy supplies require less comment. Both Quebec and Ontario depend on imports for their petroleum. Quebec imports her supplies by tanker, mainly from South America and, since the last war, by pipe line from Portland, Maine, to Montreal. Ontario draws her crude from the United States by lake tanker and also by pipe line to Sarnia and, since 1951, from Alberta by pipe line to the head of the Lakes and then by tanker. At least until Ontario gained access to this latter supply, Quebec had an edge over Ontario in the availability of petroleum. This, together with the reverse ranking in coal, explains why petroleum has been relatively more important in the fuel consumption of Quebec than of Ontario.

Both provinces are richly endowed with water power; taken together they account for over three-quarters of the total developed water power in Canada. Quebec has a distinct advantage over Ontario in hydro-electricity supply, and indeed exports a large amount of power to the latter province. Quebec's advantage results partly from the low capital costs which have been required to develop her major power sites but mainly from the location of those sites close to demand centers—a circumstance which has resulted in a minimal investment in transmission lines.<sup>4</sup> By contrast, the whole of southern Ontario is supplied with electricity mainly from two sources: power generated at Niagara Falls and supplies purchased at the Quebec border. In the main, it is the excellence of the water-power resources of both provinces which must be stressed. These resources have provided Central Canada with cheaper electricity than that available in the northeastern United States and this has offset to some extent the region's disadvantage in the price of coal.

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Policy, consists of a complicated system of *ad hoc* subsidies which are designed to render the price of Canadian coal competitive with American imports in certain specified markets. There could surely be no objection, however, either on grounds of economics or national policy, to dropping the tariff, compensating for the revenue foregone by the government by increased direct taxation, and increasing subvention payments so that Canadian coal could retain its present markets. Such a change would at least have the merit of showing clearly the competitive position of Canadian and American coal in all markets.

<sup>4</sup>We assume that these advantages are reflected in lower prices for industrial power in Quebec than in Ontario, but this assumption may be incorrect. Monopolistic pricing by private power companies in Quebec has resulted in higher rates for domestic commercial and "small power" service in that province than in Ontario, where electricity supply is in the hands of a public monopoly. See the figures of monthly electric bills given in the annual publication of the Dominion Bureau of Statistics, *Index Numbers of Cost of Electricity*. However, we are interested in industrial power rates, for which there are no published tariffs because (apart from "small power" demands) such rates are fixed by individual contract.

## III

Before we turn to a consideration of how Central Canada's resource pattern has conditioned the composition of its industry, we must be clear about certain technical and economic relationships between different energy sources. We need not dwell on the relations between petroleum, natural gas, and coal because for most industrial purposes they are technical substitutes: they are all fuels and the choice between them depends mainly on their relative prices. It is quite otherwise in the matter of fuels versus water power. Here it is essential to make a sharp distinction between heat and motive power.

In the literature of industrial development, this distinction, when it has been noticed at all, has usually been slurred over—the important works of Professors Nef and Usher being notable exceptions to the rule. The reason for this lack of discrimination is probably historical, since academic discussions of industrialism have centered around the classical industrial structures and these have developed in a coal setting. In such a setting coal has been the source of both heat and power, and for that reason it has probably seemed unnecessary to distinguish between them. But in regions like Central Canada, where hydraulic resources are plentiful and fuel resources inferior, the distinction is of major importance because the difference in type of demand is paralleled by a difference in source of supply. Heat becomes associated with fuels and power with water power.

Stated briefly, the reason for this is as follows. Because of the technical efficiency and convenience of the electric motor as compared with the cumbrous apparatus of belts and shafting which is necessary when a steam engine or a waterwheel is used to operate machinery, electricity is the pre-eminent form of energy used for motive power purposes by modern industry. On the other hand electric heat is more expensive than fuel-generated heat on a B.T.U. basis; so that electricity is not normally used for industrial heating purposes.<sup>5</sup> Electricity itself, of course, will be generated either from fuels or from water power, depending on which is the cheaper source of energy. Thus in a region that is rich in fuels but poor in water power, industry will use fuels, burned directly, for heat, and fuels in the form of electricity for power. Regions that are rich in water power relative to fuels will generate hydroelectricity: the industrial demand for heat is then in effect a demand for fuels, while the demand for industrial motive power is a demand for water-power resources.

The main exceptions to the above statements are provided by three

<sup>5</sup> See *Carroll Commission Report*, pp. 383, 387-388; also *Energy Resources and National Policy* (National Resources Committee, 1939), pp. 268-274.



instances where electricity is used for heating purposes. (See *Carroll Commission Report*, pages 388-389; *Energy Resources and National Policy*, pages 269 and 273.) In the first place, electricity is technically indispensable in a variety of electroprocess industries: depending on the process, its action may be electrolytic (as in some chemical industries) or heat-producing (as in electric steel furnaces) or both (as in aluminum reduction). Secondly, electric heat is being used in an increasing range of industrial processes where it is not a technical necessity but where its inherent properties of controllability (as to quantity, intensity, and area of application), cleanliness, and convenience give it an advantage over fuel-produced heat. This type of demand for electric heating is growing and enthusiasts argue that just as electricity has triumphed over the steam engine in power production, so it will eventually capture much of the heating market from fuels. A recent advertisement by the Massey-Harris Company of Canada states that it has developed a new process of electric forging. (See *Time*, Canadian edition, October 27, 1952, page 37.) If this process can be generalized to all types of forging processes, it will relax significantly the present limitations of electricity as a source of heat. In Central Canada there is a third exception to the rule. When central electric stations have surplus generating capacity they sell "secondary" or "boiler" power on an "if and when available" basis. This electricity is delivered to electric boilers for steam raising purposes, mainly in pulp and paper mills, and it is specially priced so that it just undersells fuels in this market. These exceptions, however, are unimportant except in a few industries. For industry as a whole, the statements in the previous paragraph represent very close approximations to reality.

The significance of the division of function between fuels and water power in hydroelectric economies becomes evident when we realize that virtually every product of modern industry requires heat as a factor of production at one or more stages in its manufacture. It then becomes clear that fuels (which can supply both heat and electricity) provide an energy base adequate to the whole range of modern production, while water power alone (which can supply only electricity) will be able to support only a very narrow range of industry centering around a few electroprocess industries.<sup>6</sup> A region where water power is highly available but where the availability of fuels is low, will be able to attract the electroprocess industries and those industries which require only small amounts of heat in their production processes.

The distinction between heat and power takes on added significance

<sup>6</sup> *Industrial Location and National Resources* (National Resources Planning Board, 1943), p. 180.

when it is realized that, for technological reasons, there can be very little substitution between heat and power in manufacturing processes. Fuels and electricity have to be used in fixed proportion in any one industry or, more accurately, in any one process.<sup>7</sup> Taken in conjunction with the preceding discussion, this means that in regions where industry would not have developed if hydroelectric power had not been available, water power and fuels are strictly complementary factors of production. It also means that, other things equal, industrial adjustment to energy patterns consisting of different proportions of fuel and water power will take place according to the Walrasian mechanism whereby particular industries will appear in different proportions as between one region and another and not according to the Marshallian mechanism whereby the technical coefficients used in each industry will vary between regions but the industrial pattern of one region will be roughly similar to that of another.

The foregoing discussion provides a theoretical base for our empirical study of industry in Central Canada. We have made a statistical study to determine the relative quantities of heat and power used by manufacturing industry in Quebec, Ontario, and the United States. The results show clearly that manufacturing activity in Ontario and Quebec has been selectively influenced by the energy situation in each province. From 1944 to 1946, manufacturing industry as a whole in the United States used the heating equivalent of about 4.8 pounds of bituminous coal to 1 kilowatt-hour of electric power. The corresponding ratio for Ontario from 1932 to 1946 averaged about 2 to 1. The Quebec figures are distorted by the relative importance of the heavily electricity-using aluminum reduction industry in the province and particularly by the wartime expansion of that industry. The heat-power ratio for Quebec over the period 1932 to 1946 averaged about .9 to 1 for all industry in the province and about 1.4 to 1 for all industry except the nonferrous metals group.<sup>8</sup>

These results must be interpreted in the light of our analytical discussion. It then becomes clear that we have here a good example of the Walrasian path to industrial equilibrium. Ranking the three areas in descending order of availability of fuel, we would have, first, the United States by a wide margin and then Ontario and Quebec, separated by a narrower margin. On the basis of the availability of electricity, the reverse order emerges, with Quebec having a slight but definite lead over Ontario and Ontario enjoying a large advantage over the United States. These energy patterns of the three areas are reflected

<sup>7</sup> *Ibid.*, p. 166.

<sup>8</sup> Full details will be made available in my doctoral thesis, "The Hydroelectric Industry in Quebec, 1898-1940," shortly to be submitted to Harvard University.

in the patterns of their industrial developments. As compared with American industry, manufacturing in Central Canada is heavily weighted in the direction of those industries which use much power and little heat, while Quebec shows the same bias, but to a lesser degree, as compared with Ontario.

To complete the analysis, one should go on and identify the particular industries which characterize the Central Canadian industrial pattern, but it would be difficult, if not impossible, to do this on the basis of present industrial statistics. Here, as in so many instances, a classification of manufacturing according to process would be most useful. We suggest only that heavily fuel-using industries tend to be correlated with the early stages of manufacturing where massive quantities of heat are required to reduce, mold, and compress raw resources into forms available for use in the later stages of manufacturing. In this latter sector of industry—the light or consumer goods industries—it is the fashioning of semiprocessed materials into specific forms and combinations that is required. This work may require only very modest applications of heat, perhaps at only a few points in the production process, while on the other hand a premium is put on controlled power to operate those complicated machines that turn out the standardized end-products of our industrial civilization. (See A. P. Usher, "Resource Requirements," in *The Tasks of Economic History*, 1947, pages 35-46.)

#### IV

We now turn to the more difficult problem of the relation between energy availability and the quantity of industry in Central Canada. In particular, we should like to know to what extent the growth of industry in Central Canada can be attributed to the region's water-power resources. How is it that Central Canada, with no fuel resources of its own, can still compete in industrial development with the north-eastern United States, a region with unexcelled fuel resources? Are the water-power resources of Quebec and Ontario sufficiently attractive to modern industry that it can afford to move to Central Canada even though it must import all its fuel requirements? Once phrased in these terms of "attraction" and "movement," it becomes clear that our problem is one in the theory of the location of industry.

Before we proceed to apply that theory, however, we must be careful to adapt received doctrine to the particular requirements of our analysis. Ever since Alfred Weber wrote on the subject, the main stream of locational theory has been dedicated to a study of the location of an individual industry (or firm) as between different sites within a region. Our problem is the macroscopic one: what determines the location of industrial structures as between regions?

Let us state the assumptions and principles of our analysis: we can note in passing the modifications which we must make in the conventional "model" of location theory. The locational problem in general terms consists of explaining the spatial adjustment of mobile things to geographically fixed things. The conventional, microscopic problem is one of explaining the location of an industry as governed by the loci of raw materials, energy resources, labor supply, and the market—all of these things being geographically fixed from the point of view of the individual industry. Here we meet the first, and major, modification to conventional theory necessitated by a macroscopic approach. The market is not fixed from the point of view of industry as a whole. Nor is the labor supply. Indeed a moment's thought makes it clear that today the major markets for manufactured goods and industrial labor supplies are both provided by the populations which grow up around—we may even say are created by—industrial structures themselves. (A study of the United States in 1939 showed that while only 23 per cent of all employed workers were engaged in manufacturing, the coefficient of association between wage earners in manufacturing and total population on a geographic basis was .78. As a result of the large movement of people from the farm to industry during the last dozen years, the coefficient will undoubtedly have risen since 1939. See *Industrial Location and National Resources*, pages 107 and 119.) The market and the labor force are determined by the industrial structure and are not parameters of it. The market and the labor force accordingly disappear from our analysis. There remain the geographical fixities and we group them into agricultural resources for food production,<sup>9</sup> resources for industrial raw materials (agricultural products other than food; forest products; and mineral products other than energy materials), and energy resources. This classification embraces most of those materials requirements of an industrialized area that are likely to be regionally localized. It omits, however, such things as climate and water supply which are regionally localized and which may have an important bearing on the location of industrial structures as well as on the location of particular industries. It also omits quarry products, such as sand, gravel, stone, clay, etc., on the assumption that these construction materials, or substitutes for them, are regionally

<sup>9</sup> Dr. William H. Dean, Jr., in his "The Theory of the Geographical Location of Economic Activities" (a doctoral thesis submitted to Harvard University in 1938) shows clearly the importance of food supplies in the location of manufacturing activity. This very important work represents one of the few attempts to treat the problem of the location of industrial structures as between different regions. Dr. Dean treats "the market" as a separate variable in his analysis, arguing that the market is located at "nodal points" of commerce (*loc. cit.*, p. 46). For the reasons given in the text, this procedure seems to be inconsistent with a regional treatment and to relate rather to the location of industry within a region.

ubiquitous, although this assumption would be difficult to defend in the case of a prairie area such as Argentina.

The principle by which the location of production is determined is the same in our problem as in the conventional one: production will be located at the site or in the region where transport costs are minimized. In this paper we give only the analysis for a two-region model and ask simply whether the industrial structure will be located in one region or the other. This greatly simplifies the presentation of our work, since in dealing with two regions only, we do not have to speak of the relative distances of the regions from each other, as we should have to do if we used a multiregional model. No sacrifice of principle is involved, since our analysis can easily be extended to three or more regions simply by taking account of the distance factor. Moreover, we do not seem to sacrifice much realism by using a two-region model, since one region's struggle for industrialization often takes the form of competition with its nearest rival.

By applying the general locational principle to our particular model, we arrive at a simple criterion by which to measure the adequacy for industrial development of a region's natural resources. Assuming that different materials have equal geographical mobility, the resources of Region A will be adequate to support an industrial development if they can supply more than 50 per cent by weight of the materials requirements of an industrial structure. In this circumstance, if Region A's resources are to be utilized at all, the real costs of transport will obviously be smaller if Region A imports its remaining industrial requirements from Region B than if Region A's materials are exported to Region B. In this case, then, Region A will be able to support an industrial development. In the reverse case, when Region A is not able to supply 50 per cent of the materials requirements of an industrial structure, its resources pattern will not be adequate to sustain an industrial development. Throughout the analysis, it is assumed that a region will be able to pay for its imports by exports either of its staple primary products or its manufactures.

In locational analysis it is convenient to speak of the "attraction" of each of the various parameters of the problem under discussion. Here it is necessary to clarify rather than modify conventional analysis. In general, the locational attraction of  $x$  is the weight of  $x$  involved (either as a factor or a product) in production, divided by a figure representing the geographical mobility of  $x$ . The locational attraction of any material thus varies directly with the amount of that material used in production, and inversely with its mobility.<sup>10</sup> In terms of our

<sup>10</sup> The ratio of the cost of a factor to total costs of production is frequently taken as a measurement of the locational attraction of that factor. This "measure" has no merit.



problem, the locational attraction of, say, coal is thus the aggregate weight of coal required by industry in Central Canada, weighted (in the statistical sense) by its mobility. Mobility is adequately measured, in monetary terms, by the freight rate applicable to the commodity in question over the particular route in question. In real terms, the mobility of a commodity is determined by those things which determine its freight rate—such things as its perishability, the type of carrier employed, and its value in relation to its bulk. In the analysis which follows we make the simplifying assumption that the mobilities of our various materials groups are equal. In discussing the results of the analysis, we drop this assumption and make allowance for the main difference in the mobilities of the different groups.

Finally, we wish to take explicit notice of the fact that our analysis in general, and the above measure of locational attraction in particular, implicitly assumes fixed coefficients of production. We have no hesitation in making this assumption. It is implicit in most locational analysis; it is an increasingly popular assumption, as witness input-output analysis; and although the point will not be argued here, I believe that for the analysis of most problems of economic development it is realistic to assume that coefficients of production are fixed in any given technological setting.

We relate this analysis to Central Canada in two different ways. The

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It is an *ex post* measure when what is needed is clearly an *ex ante* concept. As Professor Florence remarks while discussing the use of a cost-ratio measurement to indicate the importance of transport costs to the location of an industry: "It should . . . not be forgotten that cost of transport may be low for the very reason that in choosing a location . . . care was taken to make it low" (P. Sargant Florence, *Investment, Location and Size of Plant*, p. 128). Location theorists, although perfectly well aware of the shortcomings of the cost-ratio measurement, nevertheless make frequent use of it and thereby involve themselves in contradictions and statements that seem to confound common sense. Thus Professor Hoover, who was co-author of an article in which the defects of the cost-ratio measurement were clearly set out (*Industrial Location and National Resources*, p. 331), argues that although atomic energy may soon make it possible for "any region on earth . . . to generate electric energy . . . at costs comparable to present costs [in thermal stations in the United States]" this prospect "does not seem to portend . . . any revolutionary locational changes" because energy costs "are small in proportion to other items of procurement, distribution, and processing costs." (E. M. Hoover, *The Location of Economic Activity*, pp. 183-184.) W. Isard and V. Whitney (*Atomic Power*, 1952), although they reject any rigorous application of the cost-ratio measure of locational significance (pp. 72-75), minimize the probable locational effects of atomic power, largely on the basis of the relative unimportance of power costs in industrial location and the unlikelihood that atomic power will be much, if any, cheaper than thermal electricity or hydroelectricity (pp. 60-71). These expectations are no doubt sound with respect to areas which already have good energy resources and are already industrialized. But the probable significance of atomic power to the industrialization of underdeveloped areas is still an open question. Another author, Mr. L. Gordon, uses the cost-ratio measurement against his better judgment and, on the basis of it, concludes that "in the great majority of industries, fuel and power are locationally insignificant." (*Industrial Location and National Resources*, p. 159.) Yet a few pages later, working with empirical data, Mr. Gordon carries through a correlation analysis which "suggests a very far-reaching degree of general fuel orientation" (p. 166) and which shows that "the degree of power orientation . . . is . . . very substantial" (p. 174).

figures in Table 2 give the approximate tonnages of materials "apparently consumed" or produced (whichever is the larger) in Central Canada.<sup>11</sup> They purport to give the materials requirements of the whole nonfarm population of Central Canada. The assumption underlying this approach is that in any region the population in excess of the farm population gains its livelihood directly or indirectly from manufacturing industry, and that industry should therefore be charged with the materials requirements of all groups in the population with the single exception of farmers and their families. Thus the figure that we give for food is the per capita consumption of food in Central Canada multiplied by the nonfarm population of Quebec and Ontario. (Dr. Dean took only the food consumption of the workers directly employed in manufacturing as being the relevant magnitude to indicate the

TABLE 2  
ANNUAL MATERIALS REQUIREMENTS IN CENTRAL CANADA, *circa* 1947

Group No.	Materials	Thousands of Tons*	%
A	Food	5,066	7.6
B	Raw materials: agricultural	496	.8
C	Raw materials: forest products	6,220	9.3
D	Raw materials: mineral products	5,603	8.4
E	Coal	27,600	41.4
F	Petroleum	3,758	5.6
G	Hydroelectricity (coal equivalent)	17,964	26.9

\* Figures for raw materials are weights of natural products after they have been initially processed; e.g., finished iron and steel rather than iron ore, paper rather than pulpwood, base metal concentrates rather than ores. Figures are for production or consumption, whichever is the larger.

locational significance of agriculture to industry. Again, this magnitude relates to the location of one industry rather than to the location of an industrial structure.) The figures given for energy, however, relate to the whole economy, since it has not been feasible to deduct from the total figure the energy requirements of the farm population. The deduction that should be made would probably be large; its absolute size would depend mainly on what proportion of the total energy requirements of transportation one thinks should be allocated to the farm sector of the economy. The treatment of industrial raw materials involves the special difficulty of deciding at what stage of processing a "natural resource" becomes a "raw material." Our figures are meant to give the weights of natural products after they have been initially processed and are in a relatively "pure" state. This seems to be the relevant stage for measurement for two reasons. In the first place, it is

<sup>11</sup> For an estimate of annual per capital materials consumption in the United States, see the *Report of the President's Materials Policy Commission*, Vol. I, p. 4.

in a semiprocessed condition that most raw materials are received at the factory door. Secondly, in many cases the difference between the weights of natural resources and the raw materials derived from them is so great that the initial stage of processing is efficiently located at the site of the natural resource itself. Thus, as a general rule, manufacturing industry draws from the mine and the forest not mineral ores and logs but mineral concentrates and lumber.

The figures of Table 2 high light three things. They emphasize once again the importance of energy in an industrial economy. Of the nearly 67 million tons of materials listed in column 2, over 49 million tons represent energy materials. Any region without easy access to large supplies of energy would obviously fall far short of an adequate resource base for industrial development. The figures also indicate the large tonnage of food consumed annually by an industrial population. The food requirements of an industrialized region are of the same order of magnitude as raw materials of mineral origin, and considerably greater than all other raw material requirements taken together, if we take the consumption rather than the production of paper as the appropriate magnitude in this connection. Finally, the figures on which Table 2 is based indicate the overwhelming importance of iron and steel as an industrial raw material. Looking ahead to Table 3, it is seen that iron and steel accounts for almost half of the total raw materials requirements of industry in Central Canada.

The total of Table 2 is 66.7 million tons. The main imports included in these figures are coal, petroleum, and an estimated 3 million tons of processed iron and steel (or the iron ore equivalent thereof), which amount to 34.4 million tons. Let us take total imports to be 36 million tons—a figure which provides a generous allowance for other imports of food and raw materials. This leaves a domestic production of 30.7 million tons. By our criterion, Central Canada's resources apparently fall 2.65 million tons short of adequacy (half of 66.7, or 33.35) for industrial development. However, if we could make the appropriate deductions, discussed above, from our coal and petroleum figures, the adequacy criterion would be met easily.

The figures of Table 3 provide an alternative basis for analysis. They are listed on the basis of two principles. First, we try to visualize the materials requirements of a hypothetical "Central Canada" whose industrial structure is made up solely of "light" industry or, more explicitly, of all industry save that devoted to the first stages of transforming natural resources into industrial raw materials. To do this we adjust the figures of Table 2 to exclude the materials requirements of the primary iron and steel industry and the staple export industries of newsprint and nonferrous metal (notably aluminum) reduction.

Accordingly, in Table 3 we give an estimate of the paper consumption in Central Canada instead of the figure for paper production which was included in Table 2. (Paper rather than wood pulp must be considered the product of the relevant "first-stage" forest industry, and thus the raw material for publishing houses and box factories, because technological considerations make it very inefficient to split up the pulp-wood—wood pulp—paper process. For similar reasons Tables 2 and 3 give tonnages of rolled and drawn steel rather than of pig iron or steel ingots.) We also drop from our reckoning the fuel consumption of coke and gas plants because most of this figure represents the production of coke for use in the primary iron and steel industry of Central Canada. Ideally, we should subtract from other "raw materials" items

TABLE 3  
MATERIALS REQUIREMENTS OF "LIGHT" INDUSTRY IN A HYPOTHETICAL "CENTRAL CANADA,"  
*circa 1947*

Group No.	Description	Millions of tons*		%
I	Fuel resources		7.5	25.0
	Coal	6.0		
	Petroleum	1.5		
II	Power resources		9.1	30.3
	Hydroelectricity	9.1		
III	Food resources		5.1	17.0
IV	Iron and steel requirements		4.1	13.7
V	Forest resources		2.4	8.0
	Wood	1.2		
	Paper	1.2		
VI	Other raw materials		1.8	6.0
	Mineral	1.3		
	Agricultural	.5		
	Total Requirements		30.0	100.0

\* Figures are for consumption.

the tonnages used in the first-stage industries (e.g., sulphur used in the pulp and paper industry), but it would be unreasonable to attempt such refinements of basic data which themselves represent only rough approximations to accuracy.

Secondly, we assume that every region can command, at reasonable prices, fuel resources sufficient to supply the space heating and transportation requirements of an industrial economy; so that the only energy magnitude relevant to industrial development is that amount used directly in light or general manufacturing industries. This is a severe assumption. It discounts severely the significance of fuel resources to industrial development; and it thereby increases the locational significance assigned to food and raw materials. In defense of this procedure we are content to point once more to the energy figures

of Table 2 and to suggest that regions which cannot readily supply at least their domestic and transport energy requirements have little, if any, chance of industrialization. For the rest of our analysis we simply drop such regions from our list of possibilities and confine attention to the more likely candidates for industrial development. There are still some candidates left. The exclusion of domestic fuel requirements from our reckoning would not be restrictive in warm climates. It is also a justifiable exclusion insofar as some sort of domestic fuel, such as peat, lignite, or wood, is ubiquitous. A housing census in 1941 showed that 46 per cent of Canadian homes used firewood for heating, while only 42 per cent burned coal (*Canada Year Book*, 1945, page 255). The exclusion of transportation energy requirements is probably a good deal more restrictive; but railways (the main consumers) usually pass through some regions that have energy supplies, and they can, of course, transport energy from one region to another at cost by using their own facilities.

The figures of Table 3 represent the locational attraction of the various materials groupings under the assumption of equal mobilities. Our problem is to show to what extent the quantity of industry in Central Canada may be attributed to the water-power resources of Quebec and Ontario. We are dealing with a region which is devoid of fuels and one in which, from 1924 to 1939, no iron ore was mined. Ontario produced about a half million tons of ore annually from 1939 to 1944 and since then has increased output to approximately two million tons annually (*Canada Year Book*, 1945, page 312, and 1951, page 511). This output, of course, is still far from sufficient to supply the region's iron and steel requirements. For purposes of analysis we shall assume that Central Canada is entirely dependent on imports for its iron and steel needs. In terms of Table 3, our problem is therefore restricted to the analysis of an economy which must import the materials of Groups I and IV.

With hydroelectricity, good food resources, excellent forest resources, and much of its own requirements of "other mineral" resources, central Canada probably has between 55 and 60 per cent of its own industrial requirements and thus easily meets our criterion of adequacy for industrial development. With hydroelectricity and food alone, Central Canada would have 47.3 per cent of its materials requirements and be just short of industrial adequacy. With hydroelectricity, without food, and with all her raw material needs (except iron and steel), the region would have only 44.3 per cent of its material requirements and would thus fall considerably short of the 50 per cent necessary for industrialization. (Our figures give a conservative estimate of the locational significance of hydroelectricity, since in



reckoning its bituminous coal equivalent we have used a ratio of 1 kilowatt-hour to 1 pound of coal. This represents the ratio for the most efficient thermal electric plants in the United States. The average efficiency of such plants in 1945 was 1.3 pounds of coal per kilowatt-hour generated. See *Historical Statistics of the United States, 1789-1945*, page 155.) Water power has been a *sine qua non* of the growth of industry in Central Canada. The same could be said of the region's agricultural resources, and, taken together, Groups II and III closely approach the requirements of resource sufficiency for industrial development. Central Canada's large mining and forest resources, on the other hand, have been insufficient for, and almost unnecessary to, the growth of general manufacturing in the region.

It must be remembered that these conclusions are at once analytical and specific. A relaxation of our assumptions of equal mobilities and a two-region situation will alter the conclusions and, furthermore, we must be very careful in imputing any generality to conclusions which derive from a study of one particular region. When we drop the first assumption, our conclusions are strengthened as far as the importance of hydroelectricity to industry in Central Canada is concerned. In general, the mobility of coal is less than that of petroleum and raw materials (in a semiprocessed state); so that our figure for coal probably understates its locational attraction relative to these items. The mobility of coal relative to food or electricity is less evident. Here we only note one very important institutional factor which has restricted the mobility of Central Canada's hydroelectricity. Both the Dominion and provincial governments have put restraints on the export of electricity from Ontario and Quebec to the United States, and these restraints have been effective in keeping exports to a low level. The result has been that if industry has wanted to take advantage of Central Canada's excellent water power, it has had to move to Ontario or Quebec to do so.

## V

To drop our second assumption of a two-region world is to move into the whole complex field of economic development. Here the particular facts in the case are of decisive importance in any given area. Our analysis does, however, serve to make clear certain ideas which, although not novel, are useful guides to thought in this field. Table 3 suggests the relaxation of industrial parameters which has resulted from twentieth century technological trends and especially the development of electrical techniques. In the nineteenth century, when energy meant coal, it is clear that a region with all the resource requirements for industry except coal could entertain no hope of developing an industrial structure. Hydroelectricity, as we have shown, has changed

that. Moreover, such things as fuel economies, which may have been of the order of 50 per cent over the past thirty years (*Industrial Location and National Resources*, page 157), and the rise of light metals and plastics, which reduce dependence on iron and steel and therefore on coal, are probably reducing still further industry's bondage to coal. Some of those regions which had no hope of industrialization as recently as fifty years ago may now have a reasonable chance of developing at least a "light" manufacturing economy.

As the locational attraction of coal diminishes, that of food will certainly become much more important. W. Isard and V. Whitney come to the opposite conclusion as a result of conducting their argument in terms of individual industries (*op. cit.*, pages 58, 71, 158-159). Our analysis serves to underline the emphasis Dr. Dean, in his *The Theory of the Geographical Location of Economic Activities*, placed on the importance of food resources to industrial development. Just as a concentration of interest in classical industrial areas has blurred the distinction between fuel and power, because of the importance of coal in such areas, so it has disguised this important relationship between agriculture and industry, because the major industrial areas have also been areas with a good agricultural endowment. A shifting of attention to "new" areas throws into sharp relief problems that have escaped detection in older areas. Our figures suggest the considerable importance of food relative to other locational factors, but when we take relative mobilities into consideration, its locational attraction becomes still greater. Food resources are of much greater significance to industry than raw materials which, in a semiprocessed form, are highly mobile. Food, on the other hand, is bulky and is not susceptible to initial processing by which its weight is reduced to nearly the same extent that raw materials are. Most of its weight is "lost" only on consumption. Food requirements also introduce a certain biological fixity into the locational problem. Energy and raw material requirements depend to a large extent on technological considerations and their locational attractions pivot about that of food. Dr. Dean has shown how the Industrial Revolution changed a medieval food-orientated industry into a nineteenth century coal-orientated industry. Dr. Dean believed, however, that nineteenth century industry was never so decisively oriented to coal as early modern industry had been to food (*op. cit.*, pages 236 and 392). Present technological trends suggest that the future geographical pattern of industry may more nearly resemble that of medieval times than that of the nineteenth century.

General propositions, however, will not take us far in the problem of economic development. When we drop our two-region assumption, Central Canada's good fortune in having easy access to American coal

and steel becomes immediately apparent. It is not clear from what distance a resource pattern like Central Canada's could draw its fuel supplies and iron and steel requirements. It is clear, however, that the limit is a question of fact for any particular region. A region may be "very rich in natural resources" and may have more than 50 per cent by weight of the materials requirements of an industrial structure, all to no avail. To become industrialized, that region must import materials to complement its own resources, and in attempting to do so it will meet transportation resistances—the barriers of distance and technical limitations to the movement of the materials in question which are specific to its own case. If the region cannot overcome those barriers at a reasonable cost—a cost which makes the resource requirements of an industrial economy as available to it as to its competitors—its own resources will remain unused or, what is perhaps even more frustrating to the nationals concerned, will be used only as isolated, individual resources, the raw materials from which will be sent to regions more favorably circumstanced for a diversified manufacturing development.<sup>12</sup>

<sup>12</sup> It seems likely that analysis along the lines of a multiregional model would lead up to a "location" or "transport" theory of international trade, the desirability of which was indicated by A. Weber in his *Theory of Location of Industries* (translated and edited by C. J. Friedrich), pp. 193-194. See, also, W. Isard, "The General Theory of Location and Space-Economy," *Quarterly Journal of Economics*, November, 1949.

## DISCUSSION

DAVID SCHWARTZMAN: Professor Dales' paper is an application of location theory to the problem of the industrial potential of a region. It high lights certain requirements which must be fulfilled before a region can become industrialized and which might be neglected without a location approach. Mr. Dales has constructed a macroscopic theory in which it is industrial structures or regions that are the units and not individual plants. He has, however, refrained from attempting to define a region. Much of my discussion will relate to the weakness in the argument deriving from the lack of a precise unit. I shall first accept his premise that Central Canada can be distinguished as an economic region and comment on certain of his conclusions.

It should be made clear that the low fuel-electricity consumption ratio in Quebec is attributable to the absence of heavy fuel-using industries and to the presence of industries which consume large quantities of power. High inputs of either power or fuel are characteristic of plants in the early stages of manufacturing and not in consumer goods plants. Thus, the low fuel-electricity ratio is not the result of the attractive force which cheap power has for light manufacturing plants in relation to that of cheap fuel. Consumer goods industries generally spend more on fuel than on power in spite of the unimportance of heat in the processes typical of such industries. The cost of space heat is not to be neglected. Moreover, electric power equipment has only been of major importance in the last twenty-five years. In 1926, only 28 per cent of the power equipment used in Quebec was electrically driven. Nor was Quebec ahead of Canada in the use of electric power (cf. Dominion Bureau of Statistics, *Manufacturing Industries of Canada*, 1926, page 60). But there were already 200 thousand persons employed in manufacturing in Quebec. The province may have a higher proportion of the output of its manufacturing industry in the light goods category, but this is merely due to the absence of heavy industry and not to the attraction exerted by low electricity costs.

While Mr. Dales states that relative mobilities of materials must be taken into account in evaluating their locational significance, his conclusion that hydroelectricity has been essential to the industrialization of Central Canada is wholly based on a comparison of weights of materials used by manufacturing industry in the area. Consideration of mobility is introduced at a later stage of the discussion but requires further development.

Let us turn to the question of the region. The lack of a precise unit leads Mr. Dales at one point to treat Ontario and Quebec separately and to apply the term to Central Canada as a whole in other parts of the paper. It should be noted that Mr. Dales' argument is based on the costs of transporting materials and products between regions. We would therefore expect that the cost of transportation within a region would be less than that between regions.

Can we consider the northern fringe of the Great Lakes and the St. Lawrence valley to be a region? In another connection, Mr. Dales states that in

1939 the price of coal in Toronto was \$1.18 greater than in Cleveland. Owing to the high cost of rail relative to water transportation there are points in the United States which are fairly close to each other and where prices differ by more than the difference between Cleveland and Toronto. In 1939, the price differential between two metropolitan areas in Indiana was about \$3.10. (Based on Leland W. McCloud, *Comparative Costs of Competitive Fuels*, West Virginia Business and Economic Studies, June, 1951, page 18. Difference between Metropolitan Areas C and E in 1947 deflated by wholesale bituminous coal price index.) Since Mr. Dales offers no criteria by which we can demarcate regions, it is at least doubtful whether Central Canada can be considered a region. The cost of importing raw materials has been low and Central Canada might thus have become industrialized without its substantial resources of hydraulic power.

It is, of course, extremely difficult to define a region on the basis of material transportation costs; but to the extent that it is impossible to define regions in these terms, Mr. Dales' model is unworkable. The model might be worth saving and an attempt made to define regions in terms necessary to the model if through simplification it gave us insight to this complex problem. Even under the simple model, however, a detailed analysis is necessary before a region's potential can be evaluated. Such analysis can only be avoided if we adopt the assumption that whatever industries make up an industrial structure, its material requirements will be essentially the same. Mr. Dales comes dangerously close to this position when he says that "when Region A is not able to supply 50 per cent of the materials requirements of an industrial structure, its resource pattern will not be adequate to sustain an industrial development." Thus, even if we were to accept the two-region model, detailed study of possible products and requirements for such products is necessary.

An alternative definition might be constructed on the basis of population mobility. The familiar regional problems of the United States and Canada are due to the lack of such mobility. Moreover, it is because of the problem of impoverished and frequently large populations which cannot emigrate that industrially undeveloped areas are referred to as being underdeveloped or even backward. If we were to mark off regions to and from which population movements are unlikely to be large in relation to the present populations, the definition would conform to policy requirements. It follows, moreover, if what I have said about population mobility is correct, that population is a parameter and not a result of industrial growth. Supply of labor and markets need to be taken into account when industrial expansion is contemplated and the definition suggested here emphasizes such considerations.

Mr. Dales reaches similar conclusions when he drops his two-region model and stresses the importance of food. To say that food is available is another way of saying that part of an agricultural population may be diverted to industrial labor. It also implies that a market is available for manufactured products.

PENELOPE HARTLAND THUNBERG: Playing the role of discussor to a paper such as Dr. Isard has given is at once easy and very difficult. The fact that



there are so many implications contained in the technique stimulates a wide range of reactions; it is difficult to decide among them. I shall, consequently, confine my remarks to Table 1.

A table such as Dr. Isard has discussed, showing the input requirements and commodity balances of a region (in this case New England), is a treasury of economic facts pertaining to the region chosen. I should like to go further than he has gone in pointing out some of the virtues of the structure and what can be derived from it, for if the boxes could be accurately filled, one's knowledge of the region would be tremendously enhanced.

Dr. Isard correctly cautioned against box entries based on national coefficients and the assumption that the region's share of the nation's final demand is in the same proportion as the relation between the region's income and national income. This is, of course, a first approximation, and, probably for a region like New England, not a good one.

But assuming that eventually we can get all of the information we want and that the box entries are accurate, the table would show primarily the outlays of industries and final consuming units in New England and the inputs for which the outlays were made. It is not clear to me from reading Dr. Isard's paper whether the outlays are total outlays for goods and services regardless of their geographic source or whether they are outlays only for goods from the United States, including New England but excluding imports from foreign countries; and, similarly, whether gross output of New England industries includes exports to foreign countries or not. Whether it is more desirable to include or exclude foreign trade from the table depends on the purpose to which it is to be put. In general, if interest in the table represents interest in the economy of the region, it would seem more desirable to have exports included in gross output and imports in outlays. In what follows I shall assume that foreign trade is included in the data.

The column headings of the table indicate the New England unit making the outlay; the row headings show for what the outlay was made. Since the outlays of any one industry include also imputed costs such as capital consumption allowances, the sum of the outlays of any one sector would be equal to the gross output of that sector (whether foreign trade is included or not). Since the total value of the outlays made by all purchasing units is identical with total gross output, the sum of columns 51 and 52 would be the same, if filled in, and consequently the sum of the commodity balance column (53) would be zero.

The difference between the value of the output of one sector and the value of this type of product used as inputs in New England indicates the net "foreign" balance—the net inflow or outflow of this product or service between New England and the rest of the world. The sum of these net balances is zero. The only significance of this sum is that it serves as a checking device. It says only that a transaction involves two sides—a purchase and a sale—which are identical in value. The details of the commodity balance column reveal a balance of current payments between New England and the rest of the world, classified according to the industrial nature of the spending unit. The commodity balance column does not contain as much information as a balance

of payments, for it does not show the net capital movement, nor what part of the interregional trade of the area was financed by borrowing or lending activities. It shows only current transactions, and insofar as interregional capital movements do occur, or have occurred, they appear here only in the form of payments, actual or imputed, for the use of this capital during the year in question. This balance of current payments adds to zero, as does any balance sheet.

Although the sum of the commodity balance column is not significant, its components are. If the boxes were accurately completed, the sum of the commodity balances for the industrial and governmental sectors, with the opposite sign, would show the net foreign balance of the region on income account; that is, the net inflow or outflow of income payments, distributed and undistributed, between New England and the rest of the world. This net foreign balance on income account—the commodity balance (column 53) for the household row—shows the difference between outlays to all households, wherever located, by New England units, and the value of the productive services provided by the New England households to purchasing units regardless of location. The outlays to households include payments to individuals and also business reserves. The gross output of households includes the services of capital for the year. The difference is thus essentially a difference between receipts (including imputed receipts) of the owners of factors of production who live in New England and the outlays by users of factors of production located in New England. It would thus be a measure of the difference between income produced in New England and income received in the region. These interregional income flows are probably sizable and may be important in explaining variations in the level of activity as between regions.

Since the total gross output on household account equals (with minor adjustments) income received by the region (i.e., the sum of payments to the owners of the factors of production), if it is combined with the net interregional income (i.e., the commodity balance on household account), we would have a measure of income produced by factors of production located in New England. Such a measure would be one of the most valuable results of including foreign trade in the table.

One other fact that could be derived from an accurately completed table of this sort: The difference between the gross output of New England households (income received, whether distributed or not, and from all regions) and the total outlays of New England households would equal the savings for which individuals located in the region are responsible. This saving, however, would include business as well as personal saving and thereby would include the abstinence from consumption forced by undistributed business earnings on the owners of the capital as well as the usual personal savings. Since variations in the rate of personal savings out of income may account for a sizable part of differences in the level of activity among regions, it would be highly desirable to show business reserves separately from actual payments to factor owners.

Dr. Isard's first approximation to completing the boxes in the table is commendable. We can only wish him speedy success in improving the accuracy of the data.

# GOVERNMENTAL ECONOMIC ACTIVITY

## THE TREND OF PUBLIC EMPLOYMENT IN GREAT BRITAIN AND THE UNITED STATES

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During the last half century, governments almost everywhere have become far stronger influences in economic life. This paper attempts to provide a quantitative picture of certain aspects of this powerful drift. It is primarily concerned with Great Britain, but it includes some comparisons with the United States. The measure of size which we have studied is the number of persons employed by governments in Great Britain considered in relation to the size of the British labor force. These data are traced for a sixty-year period; they are analyzed so as to distinguish employment at central and local levels and in various functions; and they are compared with similar measures for the United States of America. They constitute a portion of the results obtained from an investigation which will eventually include a larger number of countries and consider such other measurable aspects of the role of government as expenditures on goods and services and the total flow of money through the governmental purse.

### *Government in Nineteenth Century Britain*

In 1891, when our figures begin, governments in Great Britain were small.<sup>1</sup> Less than 4 per cent of the working population were employed by government at all levels, central and local, in both civilian and military capacities. And a period of rapid expansion in the size of government was opening. Nevertheless, 1890 does not represent the beginning of the development from which the structure of the modern British state emerged. That development starts well over a century before and, in some of its aspects, of course, much earlier still. To understand the pattern of change in the present century, we have to recall, at least briefly, the events of the last century.

<sup>1</sup> The tables from which the figures presented in this paper are drawn, together with a full statement of the sources of the data, the bases upon which certain figures were estimated, and the limitations of the material, will appear in an *Occasional Paper* to be published by the National Bureau of Economic Research.

By 1890, the British economy had already assumed something very much like its present industrialized and urbanized appearance. And this great shift in the modes of life and work, which had begun at least a century and a half before, had already made a deep mark on British government. Rather crude indications suggest that no great changes occurred during the nineteenth century in the over-all size of the British government pay rolls relative to the size of the labor force. But government employment did increase rapidly—at least in proportion to the rapidly growing working population—and some significant changes occurred in the structure and functions of government.

The various reform acts stretching from 1832 to 1894 had, on the one side, gradually shifted the balance of power in the electorate from the landowners to the urban workers and other lower income groups and, on the other, erected a new and more efficient structure of elective local authorities. And this gradual shift in the locus of power and this increase in the competence of the governmental apparatus were accompanied by a significant development of governmental functions.

Two of the reforms were especially demanding of manpower: at the national level, the extension of the postal services; at the local level, the modernization of the police. But large strides were made in a number of other areas as well. The first steps in the creation of public institutions for medical and surgical treatment, for the care of infants and the aged, and even for education were taken under the new Poor Law. Factory regulation was begun and developed in its many branches, one of which, the establishment of healthful working conditions, was but a part of the general movement to create a healthy and sanitary environment for that major portion of the people who were coming to live in the new cities. Public health and sanitation became a foremost responsibility of the local authorities and of the central agencies set up to supervise them. The provision of pure water, so important for health, was, however, only one of a considerable number of utility enterprises which local authorities began to undertake in the last quarter of the century. Publicly-provided education remained a relatively neglected responsibility, but even that started in a very small way after 1870.

Much, therefore, that we associate with modern governmental activity had its beginning and, in some cases, a very considerable development before 1890. We need to recall this if only to understand why certain functions later expanded less rapidly than others. It is equally important, however, to see in what a narrow range of functions government workers were engaged in 1890. At the national level, it was still a government of soldiers and sailors, tax collectors and postal workers, and a very few others. At the local level, a broader range of

activities was in evidence. The police, who in the middle of the century had been nearly 60 per cent of the local employees, were no more than 30 per cent in 1890. Health and sanitation activities, water supply and other utilities, and public education were beginning to take over.

*The British Government Since 1891: A General View*

Since 1891, we can measure the growth of the British government in considerably greater detail and with some precision. The tables we have prepared from census and other official sources indicate that from 1891 to 1950 government employment increased from less than 4 to nearly 14 per cent of the labor force. These are figures which exclude all nationalized industries, utilities, and public services other than the post office. If we include the nationalized industries and services, the 1950 percentage rises to 24. Thus towards the end of the nineteenth century, not one worker in twenty-five was on a government pay roll. In the middle of the twentieth century, one in seven was working in a regular government agency and nearly one in four either in such an agency or in a nationalized industry or service.

In 1891, the chief function of British governments, as measured by their use of manpower, was national defense: nearly 50 per cent of the men hired by governments at all levels were in the armed forces. About 20 per cent were in the civilian branches of the central government. Somewhat over 30 per cent were local government employees. In the next sixty years, however, while the armed forces increased 1.8 times, the central civilian departments grew to almost 10 times and the local governments to over 8 times their former size. In 1950, the armed forces accounted for only 22 per cent of government employment; 34 per cent were civilian employees of the central government; and 44 per cent were local government workers. In addition, the workers in the nationalized industries were about as numerous as the civilian workers in the central and local governments combined.

Between 1891 and 1950, about 2.7 million people were added to the pay rolls of the regular government departments. About 440 thousand, or about one-sixth, went into the armed forces. About a million, or 37 per cent, were civilians in the central government. Some 1.25 million, or 46 per cent of the total addition, were people added to local government staffs.

During the period between 1890 and 1950, the total working population of Great Britain rose from 14.7 to 23.1 million persons, an increase of 57 per cent. Government employment, nationalized industries apart, increased 450 to 500 per cent. No other single major industry which can be followed over the entire period grew so fast. Over 30 per cent of the workers who constituted the net addition to the working population



during the sixty-year period have been put to work in some capacity by a governmental agency. Between 1931 and 1950, over 60 per cent of the additional workers have been so absorbed.

This, then, is a general picture of the phenomenal growth in the British government since 1890. We pass now to a more detailed consideration of the chief branches of government.

*The British Central Government, 1891-1950*

In 1950, the over-all size of the central government was approximately five times as great as it was in 1891. These figures include the armed forces but omit the nationalized industries.

In this massive development, one thing which calls for attention is the degree to which the growth of the central government is concentrated in recent years. Over the whole sixty-year period, about 1.4 million persons were added to the central governments pay rolls. Of these, about 1.1 million, roughly 80 per cent, were added since 1933; over 800 thousand, or 60 per cent, since 1938. Almost all the rest of the growth occurred between 1891 and 1914, a twenty-three year period in which government employment somewhat more than doubled the small figures of 1891. The middle twenty years of the period, between 1914 and 1933, however, saw no net increase. There was a huge expansion during World War I. There was a rapid and persistent contraction after the war. By 1933, the total number working for the central government was roughly the same as in 1914. In terms of percentages of the working population, the central government absorbed 2.4 per cent in 1891, 3.9 per cent in 1914, and no more than 3.5 per cent in 1933. By 1950, however, the share had more than doubled. It stood at 7.6 per cent just before the onset of the recent rearmament movement.

Through all these great changes, there has been one continuously important element; namely, the sector of central government devoted to defense. This consistently important position is not a reflection of the position of the armed forces alone. These naturally fluctuated violently as the wartime armies were mobilized and disbanded. And, though they grew on net balance over the sixty years, their percentage importance fell from some 70 per cent in 1891 to only 39 per cent in 1950. Year by year, however, with the growing complexity and mechanization of modern armies, the nonmilitary element in defense activity—the administrative staffs of the defense ministries and the workers in munitions plants—has grown larger. We cannot count these people accurately in the early years of the period, but by 1911, the armed forces, the services ministries, and their industrial workers together made up 66 per cent of central government workers. In 1921,

the figure was 62 per cent. It reached a low of 59 per cent in 1931, and in 1950 after demobilization had been completed it was 60 per cent again. In 1911, one civilian defense worker was enough to support five soldiers and sailors. In 1950, one civilian was needed for every two members of the armed forces.

It remained true, then, at the end of the period as it was at the beginning that the bulk of the British central government was engaged in defense work. Nevertheless, the percentage share of defense did fall since the end of the last century. Compared with the 60 per cent figure for 1950, the armed forces alone absorbed about 70 per cent in 1891. Another important branch of declining importance was the post office. This too dropped over 10 percentage points between the early part of our period and its end. It is into the gaps thus opened that the younger branches of modern government—the social services, the regulatory departments, and public construction agencies—have moved.

All three of these branches, of course, had been growing slowly over the years. Before World War II, however, large gains of an enduring sort were confined to the social services. In the years immediately preceding World War I, Parliament passed the notable acts of Edwardian liberalism. An Act of 1908 established old age pensions. The Labour Exchanges Act of 1909 set up a national system of employment exchanges. And the National Insurance Act of 1911 got both health insurance and unemployment insurance under way.

Both the social service departments and the regulatory agencies grew rapidly during World War I. Manpower regulation and war pensions required the establishment of the Ministries of Labour and of Pensions, still at the center of British social service activities. War-induced shortages and industrial problems produced a series of agencies to control food, shipping, overseas trade, and mines, to plan reconstruction, and to conduct scientific and industrial research. With the end of the war, however, the regulatory agencies were largely dismantled. The economic problems whose solution might have been sought through government intervention, however, did not vanish. So the social service departments were maintained and, indeed, expanded. Unemployment insurance and the labor exchanges were extended. The statistical work of the Ministry of Labour was enlarged. And in the midst of the depression, an Unemployment Assistance Board took over noninsurable relief from the local authorities.

The history of these agencies in World War II and its aftermath is quite different. Once again a large burden of wartime responsibilities required rapid expansion. But in the first war, the expansion in the social services, in the regulatory departments, and in the agency (or public works) departments was about 50 thousand persons. In the

second war, it was 106 thousand. More important, however, is the fact that after World War II these departments, far from being dismantled, were maintained and expanded. It is this fact, together with the nationalization program, which gives to the postwar years in Great Britain their distinctively socialist character. The social service departments, responsible for the great new Health Scheme and for a string of new or enlarged insurance and pension arrangements, grew 42 per cent between 1945 and 1950 and almost 100 per cent between 1939 and 1950. The regulatory departments, directing trade, industry, and transport, multiplied and expanded with the scope and detail of planned economic controls. They grew 39 per cent after the war, but 450 per cent between 1939 and 1950. Finally, the agency services, with their construction responsibilities, were left just three times as large in 1950 as they were before the war. Since 1936, these three groups of departments, representing the government's participation in social welfare activities, in the regulation and fostering of the economy, and in real capital formation, had added 200 thousand men to their staffs. They had become 3.6 times as large as they were before rearmament started in 1936, and, in a civil government itself over twice as large, absorbed one civil employee in four, instead of one in six.

The last fifteen years clearly have witnessed a large expansion in the British central government and a great change in its character. Soldiers and sailors, postal clerks, and tax collectors together are still the bulk of the government's employees. But for each 10 soldiers, there are now 5 civilians to produce their equipment and maintain their organization. In 1914, there were only 2. For each 10 postal employees there are now more than 12 workers in the other civil departments. In 1914, there were only 3.5. In 1914, for each 10 tax collectors, there were 20 employees in other civil departments apart from the post office. Today there are 50.

In the closing years of our period, a new type of public service rose to prominence through the series of nationalization acts which were carried out by the recent Labour Government. In 1950, total employment in the nationalized coal mining industry, transportation, the gas and electricity supply industries, the Bank of England, the B.B.C., and the nationalized hospitals was 2,350 thousand, or 10 per cent of the British working population.

These services differ in function from the bulk of government service in that they are responsible for producing goods which, for the most part, are of types hitherto considered to lie outside the governmental sphere. And they differ in organization in that their assets are owned and their operations managed by public corporations enjoying a high

degree of freedom of action without continuous close supervision by Parliament.

The formal position of the work force in the nationalized sector remained essentially the same as in private industry. The employees of the public corporations were not assimilated into the government service and did not acquire civil service status. Wages and working conditions are determined by collective bargaining.

Public control is exercised principally by the power of the Minister to appoint and remove the members of the central Boards and to give them general directions on matters affecting the national interest.

The time which has elapsed since the inception of nationalization in Britain is too short to permit an appraisal of its effect on the machinery of government. It may be pointed out at this time, however, that, in contrast to the expansion required by the control of private industry, the new responsibility for supervising nationalized industries appears to have had little effect on the size and structure of the British central government. With the single exception of the Ministry of Civil Aviation, it did not lead to the creation of new departments. And the staffs of those older departments which became responsible for nationalized industries and services (that is, mainly the Ministries of Fuel and Power, of Transport, and of Health) have decreased since the beginning of the nationalization program.

#### *Local Government in Great Britain, 1890-1950*

If the central government was growing most rapidly towards the end of our period, the opposite was true of the local governments. The number of persons on local pay rolls was growing most rapidly at the beginning of the period, and the rate of growth has since declined steadily. If our figures are anywhere near right, employment more than doubled between 1891 and 1901. Thereafter there was a steady decline in the rate of growth in successive decades. Between 1931 and 1938, there was virtually no change. And though employment increased markedly during the war, by 1950 it had been cut back so far that it stood only 12 per cent higher than in 1938.

This rapid, although declining, rate of expansion between 1891 and 1931 raised local employment from 1.2 per cent to 5.9 per cent of the labor force. But between that time and the present, the share of the working population absorbed by local government has hardly changed. The great increase in government's absorption of manpower since 1931 has been in the central government.

By the same token, local government's share in the total personnel used by all governments first rose and then declined. In 1891, local



governments used just one-third of all the men hired by British government, including the armed forces. Until 1931, local government grew so much more rapidly than the other branches that its share rose to 61 per cent. By 1950, however, it was down to 44 per cent even when we neglect the recent nationalizations. If we take them into account, the share falls to 26.

Something can be said to rationalize the disparate rates of growth of local and central government in our period. Apart from the continuing expansion and mechanization of the armed forces, the characteristic feature of central government in recent years is the development of centralized social services and of economic controls. Both are comparatively late reactions of government to the progress of capitalism and industrialism in Great Britain. Social services have traditionally been a local responsibility, and, until comparatively recently, deliberate economic controls have been regarded as a peripheral aspect of the operation of a private enterprise system. Thus what have come to be the most important functions of central government on its non-military side are comparatively recent developments.

The problems raised by an industrial and urbanized civilization for local government appeared much earlier. This becomes quite clear if we consider the functions which local government has assumed. These are easily grouped under four heads: first, the protective services, chiefly police and fire protection; secondly, the communal or environmental services, of which sewage disposal, street cleaning, and other common sanitary services, as well as street and park maintenance, are good examples; thirdly, the personal social services like education, medical care, poor relief, and housing; and, fourthly, the trading services, or municipal utility enterprises.

Two of these four general classes of activities, namely, the protective services and the environmental services, forced themselves on the attention of the local authorities at a comparatively early date. Solution of the problems at which they were directed was a necessary condition, not merely of the growth of the new cities, but even of population growth itself, at least at the rate experienced in the last 150 years. Both functions began to be undertaken seriously by the middle of the nineteenth century, and both had reached a highly developed state in Great Britain by 1890.

With regard to the third class of function, the personal social services, one portion, poor relief, was an ancient local responsibility. Its reorganization in 1834 led to a certain development of specialized institutions—infirmaries, nurseries, and schools for paupers—which may be considered early forerunners of modern public hospitals, child care, and education. In the main, however, the personal services are an area



which was neglected in the nineteenth century and developed in the twentieth. The rapid growth of public education begins with the Act of 1902 and continues through the first decades of the century. The growth of publicly-provided medical care starts with the school medical service which began in 1907.

Poor relief proper continued to be a local responsibility throughout almost the entire period. Its weight, however, was gradually being lightened by the central government's experiments with insurance and pensions. Its place has been more than filled by the municipal housing programs. These had a considerable development between the two wars and became a major activity after World War II.

The relatively recent growth of the personal services, as compared with the protective and environmental services, seems understandable. The public interest in the various personal services is far less direct and obvious and the private interest of the individuals affected is what is most apparent. The supply of these services, therefore, at first takes on the cast of charity. It takes a relatively long time for the social interest to be seen and for standards of public responsibility to develop. Also, since personal service is expensive, its provision tends to wait until incomes rise. Still another factor presumably involved is the gradual transfer of political power from landlords and businessmen to the urban working class which is part of the progress of industrialization. Given that slow shift of power, it is no wonder that the expansion of local government starts with services of more direct benefit to the rich as well as poor, like protection from violence and epidemic, and moves towards services of more direct benefit to the poor alone, like public education, medical care, and housing.

Finally, there are the trading services or municipal utilities. As natural monopolies, they had to be strictly regulated or directly operated. In Britain, the latter solution was chosen in considerable part, and the rate of growth in municipal utilities employees has depended in large degree on the rate of growth of the industries themselves. By 1890, this had already begun to taper off so far as water supply was concerned. But gas supply was still expanding and electricity and local transport were about to enter several decades of very rapid growth.

As we review these circumstances, it becomes understandable that the early decades of this century should have been a period of relatively rapid growth in local-authority employment and that the rate of increase should have leveled off later. In 1890 all the major classes of local activity except the protective services were in a stage of rapid expansion. The growth of environmental services was soon to slow down, but the personal social services and the trading services were just at the threshold of their period of most rapid development. Not

only did the growth of these services level off after their provision had been expanded to reach the bulk of the population, but their locus tended to shift from the local authorities to the central government.

This tendency towards centralization can be discerned very early in the development of the modern British government. It appears in the nineteenth century in the creation of poor law, police, health and education inspectorates, and in the expanding system of grants-in-aid. It appears prominently in this century in the proliferation of insurance and pension schemes by which the relief of destitution was at once regularized and centralized. It is apparent also in the creation of the national system of trunk roads in the thirties. It is especially active after World War II in the new insurance and pension schemes and in the assumption of wider responsibility by the central government for residual relief. And it appears most prominently in the national health scheme which has absorbed the local-authority hospitals and maternity homes and much of the school medical service and in the nationalized public utility industries into which the municipal utilities have been merged.

In this shift towards centralized responsibility, the retarded growth of municipal government and the accelerating growth of central government meet. The shift in part expresses a natural desire to exploit the economies of scale and the wider range of specialized services which are possible when larger areas and populations are brought under unified administration. More important, perhaps, it reflects the growing interconnectedness of people's lives which is a feature of the advance of industrialism. On the one hand, the realization of interdependence makes people impatient with the halting and uneven development of services which accompanies local responsibility. And, on the other hand, the sense of unity which is fostered by interdependence makes people willing to tolerate the redistributions of income which are required when common standards are widely applied.

#### *Trends in Britain and the U.S.A.*

With the help of Solomon Fabricant's work on the size of the U.S. Government,<sup>2</sup> we are in a position to make a few broad comparisons between the development of government employment in this country and Great Britain. In this discussion, we leave out of account the numbers employed in Britain in the nationalized industries and those employed as emergency workers in the United States.

With these exclusions, aggregate government employment in the two

<sup>2</sup> *The Trend of Government Activity in the United States since 1900* (National Bureau of Economic Research, 1952).

countries when expressed as a percentage of the labor force (of total employment in the U.S.) appears to have developed in much the same way in the two countries. In 1900, total government employment in the U.S. was 5.1 per cent of all employment. The comparable British figure was 5.8 per cent. By 1949, the American government share was 12.5 per cent; the British share, 14.1 per cent. Thus the American ratio was 88 per cent of the British at the turn of the century and 89 per cent of the British fifty years later. These ratios refer to full- and part-time government workers and hence may be slightly affected by the apparently larger number of federal part-time workers in the United States at the beginning of the century. Yet over the entire period under review the similarity in the growth of the two governments seems sufficiently well established.

The pace of advance was not parallel throughout. As a share of the labor force, British government employment grew more rapidly than American during the first two decades of the century; during the twenties and, still more, the thirties, U.S. government employment grew more rapidly than British; and the British moved ahead again on net balance between the beginning of World War II and 1950.

The similarity in the net movement of the government shares means, of course, that the size of American government increased more rapidly than that of British government during this century. For the British labor force grew only 39 per cent during the last fifty years while the American increased 116 per cent. In this country total government employment grew by 7.5 million person to 5.5 times its 1900 size; in Great Britain, government employment rose by only 3.2 million persons to 3.4 times its size in 1901.

These aggregates have their chief significance as measures of the total quantity of resources absorbed by government. To understand the trends in the totals and to assess their significance in other ways, we need to know a great deal about the components of aggregate employment. Here one can make a few revealing comparisons, but not nearly so many as one would like.

The more rapid rate of growth of total government employment in the United States is entirely a phenomenon of the armed forces. In 1900, our Army and Navy were barely 30 per cent as large as Britain's. But between 1900 and 1949—that is, before the beginning of the Korean war—they increased 12 times, from 126 thousand men to 1,642 thousand. Their share in total government employment rose from 9 to 22 per cent, and their share in employment as a whole from 0.5 per cent to 2.7 per cent. Britain's forces, on the other hand, grew by only 63 per cent. Compared with the 9 per cent which the U.S. forces

were of total government employment in 1900, the British forces were 44 per cent. Half a century later, the forces used 22 per cent of government workers in both countries.

So far as civilian employees go, the U.S. and British government staffs grew at almost exactly the same rate on net balance over the whole period. Taking federal, state, and local employees together, there were 2.33 U.S. employees to 1 British employee in 1900 and 2.34 U.S. employees to 1 British employee in 1950. Civilian employment had increased 370 per cent in both countries.

All this, in turn, implies that, in terms of labor force percentages, civilian employment by the U.S. Government was more important than that by the British Government in 1900, but that the U.S. share grew less rapidly than the British. In 1900, 4.6 per cent of the persons employed in the United States were civilian employees of government. In Great Britain in 1901, the percentage was only 3.3. Fifty years later, the comparable figures were 9.8 for the U.S. and 11.1 for Britain. The U.S. share had little more than doubled but the British share had considerably more than tripled.

From the point of view of the movement of the aggregates, this is probably the most intriguing difference between the two countries. To appreciate this we might start with the tentative hypothesis that, among countries which are members of the same general culture and which operate with generally similar economic institutions, the civilian branches of government will absorb a share of the labor force closely related to the level of national income per capita. This theory is consistent with the commonly asserted propositions that governments have grown very rapidly everywhere during the last seventy-five years and that this growth is a reflection of the problems engendered by industrialism and urbanization and of the greater volume of services with which communities can afford to provide themselves through government as their incomes rise. Per capita national income may be taken to be a crude index of this constellation of forces.

It is a plausible argument and it would be surprising if it did not contain a considerable measure of truth. Yet on this theory, we should have expected to see civilian government in the United States expand far more rapidly than in Great Britain. The reverse seems to have been the case—a fact which speaks either for the crudity of the theory or for the inadequacy of national income as a measure of the strength of the forces to which the theory points.

Local authority employment in Great Britain and state and local—which we shall call simply “local”—authority employment in the United States have both been larger than civilian employment in the central governments of their respective countries. As might be expected

in a less highly centralized country, the relative importance of local government has been greater in the United States. Around 1900, the employment ratio was 3.4 to 1 in the United States and 2.3 to 1 in Great Britain. In both countries, the central government has grown more rapidly than the local. And curiously enough the pace of advance was virtually equal at the same governmental level. The ratio of local to central government employment, therefore, declined in both countries in the same proportion.

The greater relative importance of local employment in the United States compared with Great Britain is in good part, although not entirely, a reflection of the greater relative importance of education in this country. Throughout our period, public provision for education has been on a more liberal scale in this country than in Great Britain. Measured as a percentage of the labor force, government employment in education was twice as important in this country as in Great Britain in 1900. As late as 1950, it was still 84 per cent larger.

To some extent, the difference reflects the somewhat greater importance of private education in Great Britain. But much more significant is the difference in the duration of schooling in the two countries. In the United States, 42 per cent of all children between the ages of fifteen and seventeen were in school as early as 1900. But even in 1913 only some 12 per cent of the British children of those ages were in grant-aided schools. In 1940, 75 per cent of the American fifteen-seventeen year-olds were in school; in Great Britain in 1950 about 13 per cent of those fifteen to eighteen were still in school.

These differences in the educational systems of the two countries are only examples of the many differences between them in other fields of public service. We shall not understand the differences in the size of government in the two countries until we have information about the many detailed functions of government. For the time being, however, we cannot go further.



## TRENDS IN FEDERAL, STATE, AND LOCAL GOVERNMENT EXPENDITURES SINCE 1890

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### I

A discussion of government expenditures in the United States over the past sixty years can appropriately begin by referring to Wagner's so-called "law" respecting the increase of state activities: "Comprehensive comparisons of different countries and different times show that, among progressive peoples . . . an increase regularly takes place in the activity of both the central and local governments. This increase is both extensive and intensive: the central and local governments constantly undertake new functions, while they perform both old and new functions more efficiently and completely."<sup>1</sup>

There is little in the experience of the United States over the past sixty years to contradict the law as thus stated. Moreover, during the greater part of its history the Western World has accepted governmental economic activity as a normal characteristic of a well-ordered society, and this outlook has not been foreign to the United States. Before the Civil War, the states were the agencies for the conduct of widely varied economic functions. The beginning of the sixty-year span with which this paper is concerned marked the close of the period of relative nonintervention which followed the Civil War, with the undertaking of new governmental regulatory and welfare functions. This change, the acceleration of the transformation of the United States into an integrated national economy and of the trend toward urbanization, and later the revolution in America's international position, all have had a part in the growth of federal, state, and local budgets.

As F. S. Nitti, of the University of Naples and one-time premier of Italy, observed at the turn of the century, in studying public expenditures it is never sufficient to stop with the "seen"; that is, the budget figures. Numerous "unseen" factors affecting expenditure levels must be taken into account, among which Nitti mentioned the extent of the country's territory at different times, the population, the amount of private wealth, and variations in the value of money.<sup>2</sup> Even this

<sup>1</sup> Adolph Wagner, *Grundlegen der politischen Oekonomie* (3rd ed., 1893), Bk. VI, Ch. 3, cited in Charles J. Bullock, *Selected Readings in Public Finance* (3rd ed.; Ginn and Co., 1924), p. 32.

<sup>2</sup> *Principi di scienze delle finanze* (1903), pp. 64-100. Bullock, *op. cit.*, pp. 32-47.

list leaves out many factors which should be mentioned in a full discussion of the subject. For the more limited scope and conceptual framework of this paper, I have emphasized the following variables affecting the levels of governmental expenditures: the size of the population, the amount of benefits and services provided per person, and the cost per unit of benefits and services rendered.

National income and product also is a closely related variable, in that it has enabled steady increases in the levels and scope of government benefits and services without curtailing private consumption and investment, save in wartime.

Unfortunately, it is impossible to measure the influence of the variables mentioned with sufficient precision to say what part of the increase in government expenditures can be attributed to each.

Like all price and production measures involving combinations of dissimilar units, measuring changes in the amounts and costs of government services and benefits poses difficult conceptual problems. I cannot deal at length with the problems here but will mention a few of them briefly.

First, there is the difficulty of conveying in terms of dollars an adequate idea of the changes in government benefits and services since the age of horsecars. Second, many government services and benefits are not enjoyed directly by individuals but are corporate and indivisible, like the benefits provided by a battleship or a prison.

Determining the cost per unit of benefits and services involves relating changes in such unlike items as compensation of government employees, prices of goods and contractual services purchased, interest on indebtedness, welfare payments, etc. The price-cost relationships can be worked out if sufficient data are available. But the frequently used expedient of converting government expenditures to constant-value dollars by a consumer price index is likely to produce considerable distortion. For instance, the consumer price index may double but if employees' compensation rates rise only 50 per cent, the cost to the taxpayers per unit of services rises only 50 per cent, not 100 per cent, assuming that productivity is unchanged. Consumer price indexes are appropriate for deflating some types of transfer payments, e.g., welfare payments, veterans' pensions, etc., where the object is to measure changes in amounts of benefit rendered.

This leads to the next question: how to measure changes in governmental employees' productivity? This problem poses all the conceptual difficulties of measuring productivity changes in private industries, plus a few more difficulties arising out of the primitive state of governmental accounting and the lack of data on output and techniques for measuring output.

Despite the conceptual problems I have mentioned, I think a useful perspective is gained by expressing expenditures in dollars per person, and thus eliminating at least part of the influence of population growth from the picture. Price-cost effects are more difficult; and, for the most part, I do not attempt in this paper to go beyond comparing trends of per person expenditures in current value dollars with trends in various price indexes and with national income and product trends.

In addition to the variables influencing the levels of government spending, I have also emphasized in setting up this paper the functional categories of government spending, and the levels of decision-making involved; i.e., whether decisions respecting the disposal of the community's product are taken at the federal, state, or local levels, or, as in the case of transfer expenditures, are relegated by the government back to individuals.

## II

There are data on federal government expenditures since the founding of the republic. Historical analysis, however, is complicated by changing definitions of what is an expenditure and when it takes place and by the different systems of classification which have been used from time to time. The classification employed for many years in the *Annual Reports of the Secretary of the Treasury* uses the following principal categories, which reflect both the outlook and the limited range of activities in the nineteenth century: war department, including rivers and harbors and the Panama Canal, navy department, Indians, veterans' pensions, postal deficiencies, civil and miscellaneous, and interest. Obviously there is little congruity between these categories and the present Budget Bureau functional categories.

Reliable state and local government financial data are sketchy. The Census Bureau has conducted decennial censuses of state and local finances since 1850, but there are complete data for only 1890, 1902, and 1942. For the past few years, however, states and large cities have been covered annually and counties occasionally.

Various independent estimates of state and local expenditures have been made, including those of the National Industrial Conference Board during the twenties and thirties. Estimates going back to 1929 are included in the Commerce Department's national income and product series. The estimates of state-local expenditures, however, are necessarily tenuous. Moreover, the Commerce Department's series are devised for use with the national income and product accounts and differ conceptually at many points from usual government financial reporting and from the Census Bureau's uniform classification system.

For studying the changing patterns of government functions, therefore, I have relied principally upon the federal expenditures data pre-

sented in the *Annual Reports of the Secretary of the Treasury*, and for 1939 and after, the Budget Bureau's functional classification. I have drawn state-local expenditure data mainly from Bureau of the Census reports. These data and the classifications I have employed are not entirely consistent throughout but are sufficiently so to give a reasonably good picture of changes over long periods. I have used Commerce Department data for analyzing the changing quantitative role of government expenditures in the national economy, and these data, of course, are subject to various margins of error.

Finally, I have excluded any analysis of provisions for debt repayment. Capital outlays, including those financed by debt, are included in most expenditures series; to include both these and provisions for debt retirement would, of course, involve double counting.

### III

In the pre-World War I period, the country was still predominantly rural, 65 per cent of the population being classified as rural in the 1890 census and 54 per cent in the 1910 census. Expenditures at all levels of government were low. Federal government internal functions included in the nineties the management of currency, weights, and measures, the collection of customs and internal revenues, the post office, and the federal courts, and little else. As for state-local responsibilities, Lord Bryce observed that "the powers which remain vested in the States alone [include] legislation on private law, civil and criminal, the maintenance of law and order, the creation of local institutions, the provision for education and the relief of the poor, together with taxation for the above purposes." (*The American Commonwealth*, Volume 1, pages 315-316.)

In analyzing federal expenditures, I have isolated expenditures on two categories of activities which are the unique province of the federal government—foreign relations and national defense—and expenditures on veterans' benefits and interest on the national debt—items reflecting primarily military activity. Other federal expenditures are chiefly for internal functions and are lumped in a fifth category.

Federal expenditures in 1890 (excluding debt retirement) amounted to only \$5.04 per person. National defense and veterans' pensions accounted for 51 per cent and interest for 11 per cent. Expenditures on foreign intercourse were less than 1 per cent—only 3 cents per person. Expenditures on internal functions were 37 per cent of the total.

Parenthetically, Treasury receipts in 1890 were \$6.39 per person, of which customs supplied 57 per cent and liquor and tobacco taxes 35 per cent.

In 1913, expenditures were still nominal—\$7.46 per person, of which

TABLE 1  
FEDERAL EXPENDITURES INCLUDING AND EXCLUDING AID TO STATE AND LOCAL  
GOVERNMENTS BY CATEGORY FOR SELECTED YEARS, 1890-1952  
(Millions of Dollars)

Item	1890	1902	1913	1925	1932	1939	Average 1948, 1949, 1950	1952	Estimated 1953
Foreign relations	2	3	5	15	19	19	5,348	4,809	
National defense	55	155	252	619	716	1,077	11,720	39,106	55,028
Veterans' benefits									
Total	107	138	175	749	862	559	6,674	4,902	4,500
Excluding aid							6,630	4,894	
Interest	36	29	23	882	599	941	5,503	5,859	6,350
Internal and miscellaneous									
Total	118	160	270	798	2,338	6,370	8,756	11,469	13,150
Excluding aid	*	153	261	674	2,100	5,454	6,890	8,755	
Total expenditures, excluding debt retirement†	318	485	725	3,063	4,535	8,966	38,001	66,145	79,028
Total expenditures, excluding debt retirement and aid†	*	478	716	2,939	4,297	8,050	36,091	63,423	

SOURCES: Data for years prior to 1939: *Annual Reports of the Secretary of the Treasury; Historical Statistics, op. cit.*, pp. 299-301, Series P 99-108; *Statistical Abstracts*. Expenditure data for 1939, 1948, 1949, and 1950: *United States Budgets* (1951), Appendix 5, and 1953, Special Analysis I. The 1952 data and 1953 estimates: *Treasury Bulletin*, November, 1952, p. 2, Table 2; estimates based on President's revised estimate released August 19, 1952. For years prior to 1939, foreign relations expenditures include the category entitled "Foreign intercourse" in the older *Reports*, plus salaries of State Department personnel in Washington. National defense expenditures exclude expenditures on rivers, harbors, flood relief, national parks, and the Panama Canal. Veterans' benefits for years prior to 1925 include only pensions. For data on aid to state and local governments, see Table 3.

\* No figures on grants available.

† Figures may not add to totals because of rounding.

TABLE 2  
PER PERSON FEDERAL EXPENDITURES INCLUDING AND EXCLUDING AID TO STATE  
AND LOCAL GOVERNMENTS, BY CATEGORY FOR SELECTED YEARS, 1890-1952

Item	1890	1902	1913	1925	1932	1939	Average 1948, 1949, 1950	1952
Foreign relations	\$ .03	\$ .04	\$ .05	\$ .13	\$ .15	\$ .15	\$ 36.01	\$ 30.88
National defense	.87	1.95	2.59	5.34	5.74	8.23	78.91	251.08
Veterans' benefits								
Total	1.70	1.75	1.80	6.47	6.90	4.27	44.94	31.47
Excluding aid							44.64	31.42
Interest	.57	.37	.24	7.61	4.80	7.19	37.06	37.62
Internal and miscellan- eous								
Total	1.87	2.02	2.78	6.89	18.73	48.67	58.96	73.64
Excluding aid	*	1.93	2.68	5.82	16.82	41.67	46.39	56.21
Total expenditures, ex- cluding debt retire- ment†	5.04	6.13	7.46	26.44	36.33	68.51	255.88	424.69
Total expenditures, ex- cluding debt retire- ment and aid†	*	6.04	7.36	25.37	34.42	61.51	243.02	407.21

SOURCES: See Table 1. Population estimates used in converting data to per person basis: *Historical Statistics, op. cit.*, p. 26, Series B 31-39, *Statistical Abstract* (1950), p. 8, No. 7, and *Survey of Current Business*.

\* No figures on grants available.

† Figures may not add to totals due to rounding.



national defense and veterans' benefits accounted for 59 per cent and internal functions 37 per cent.

From 1890 to 1913, total expenditures per person increased 48 per cent. Items other than interest increased 62 per cent. Increases in various price indexes in the same period range from 24 to 28 per cent, and it probably would be safe to put the increase in government costs at around 25 per cent. On this assumption, the increase from 1890 to 1913 of expenditures other than interest, per person in constant-value dollars, was probably about 29 per cent. Defense expenditures accounted for about 92 per cent of the constant-value dollar increase,

TABLE 3  
FEDERAL GRANTS TO STATE AND LOCAL GOVERNMENTS  
SELECTED YEARS, 1890-1952

(Millions of Dollars)

1890	*
1902	7†
1913	9†
1925	124‡
1932	238†
1939	916‡
1942	854*
Average, 1948, 1949, 1950	1,910§
1952	2,722§

\* Not available.

† Census Bureau, *Historical Review of State and Local Government Finances* (State and Local Government Special Studies No. 25: 1948), p. 13, Table 1.

‡ District of Columbia figures from Census Bureau, *Financial Statistics of Cities, 1925*, p. 222, Table 8, and 1939, Table 10, p. 80. Figures on other aid from Council of State Governments, *Federal Grants-in-Aid* (1949), p. 31, Table 1.

§ *United States Budget, 1953*, Special Analysis G, p. 1196. Estimates of veterans' benefit grants used in Tables 1 and 2 are from the special analysis sections of the *Budgets* for 1950 (p. 1370), 1951 (p. 1139) and 1952 (p. 996).

internal expenditures for 27 per cent, and veterans' benefits a —20 per cent.

Some offset to the general price increase was provided by a decrease of about 43 per cent in the average rate of interest on government debt.

Gross national product in these decades increased more rapidly than federal expenditures. Kuznets' estimates show a 142 per cent increase in average annual gross national product between the decades 1884-93 and 1909-18.<sup>3</sup> Average annual federal expenditures increased 116 per cent between these decades.

What of state-local expenditures in this period? In 1890, they totaled 560 million dollars (\$8.88 per person) and were about 76 per cent higher than federal expenditures. They were nearly five times

<sup>3</sup> *National Product Since 1869* (National Bureau of Economic Research; 1946), p. 119, Table II, 16.

federal expenditures on internal functions. Expenditures on operations in 1890 were \$7.58 per person, of which 30 per cent went for schools, 9 per cent for public safety (mostly police and fire), 17 per cent for administration and control, and 18 per cent for streets and highways (includes some capital outlay items). Hospitals, public welfare, and correction took only 11 per cent—82 cents per person.

By 1902, per person state-local expenditures had risen to \$12.85. Reported expenditures in 1913 were \$18.01 per person and operations expenditures \$11.98. (State-local figures for 1913 are incomplete, omitting expenditures of several categories of units, including incorporated places with populations under 2,500, school districts overlying such units, townships, and special districts.) Over the period 1890-1913 the expenditure pattern changed, with relatively less being spent for streets and highways and more for public safety, sanitation, health, welfare, and correction. The greater emphasis on the latter categories in part reflected increased urbanization.

From 1890 to 1913, state-local expenditures per person increased by about 103 per cent, but the figure is so high because of a twelve

TABLE 4  
STATE-LOCAL GOVERNMENT EXPENDITURES FOR SELECTED YEARS, 1890-1950  
(Millions of Dollars)

Item	1890	1902	1913	1932	1942	Estimates 1950
Total, excluding debt retirement*	560	1,016	1,751	8,406	10,034	20,895
Capital outlay	35	168	442	2,056	1,017	
Interest	47	67	135	724	515	
Contributions to trust funds and enterprises†	‡	‡	9§	92§	209**	
Payments to unemployment compensation funds					1,076	
Operations, total	478	782	1,165	5,533	7,216	14,260
Operations, by function*						
General control	82	164	211		667	
Public safety	43	97	181		757	
Highways	84	117	157		807	
Sanitation and health	3	34	69		306	
Hospitals, public welfare, correction	52	106	158		1,802	
Schools and libraries	145	236	341		2,406	
Recreation	3	14	24		97	
Miscellaneous and unallocable	67	14	24		374	

SOURCE: *Historical Review of State and Local Government Finances*, op. cit., p. 14, Table 3, and p. 17, Table 6.

\* Figures may not add to totals because of rounding.

† Excludes state payments to unemployment compensation funds.

‡ Included in operations expenditures.

§ Estimated contributions to pension funds of states and cities over 30,000 population and their overlying governments.

\*\* Contributions by states and local governments of over 100,000 population.

fold increase in capital outlays. (Amount reported in 1890 is understated; some nonsegregable capital outlays are included in operation expenditures.) Operations expenditures—a more accurate index of the levels of government activity than total expenditures—increased 58 per cent. By comparison, prices increased 24-28 per cent. Allowing for some understatement of 1913 operations expenditures, it appears that per person operations expenditures in constant-value dollars increased by about one-third.

TABLE 5  
PER PERSON STATE-LOCAL GOVERNMENT EXPENDITURES FOR SELECTED YEARS,  
1890-1950

Item	1890	1902	1913	1932	1942	Estimates 1950
Total, excluding debt retirement*	\$8.88	\$12.85	\$18.01	\$67.33	\$74.49	\$138.66
Capital outlay	.56	2.12	4.55	16.47	7.55	
Interest	.75	.85	1.39	5.80	3.82	
Contributions to trust funds and enterprises†			.09	.74	1.55	
Payments to unemployment compensation funds					7.99	
Operations, total	7.58	9.88	11.98	44.32	53.58	94.63
Operations, by function*						
General control	1.30	2.07	2.17		4.95	
Public safety	.68	1.23	1.86		5.62	
Highways	1.33	1.48	1.61		5.99	
Sanitation and health	.05	.43	.71		2.27	
Hospitals, public welfare, correction	.82	1.34	1.63		13.38	
Schools and libraries	2.30	2.98	3.51		17.87	
Recreation	.05	.18	.25		.72	
Miscellaneous and unallocable	1.06	.18	.25		2.78	

SOURCE: Computed from Table 4. For population estimates, see notes to Table 2.

\* Figures may not add to totals because of rounding.

† Excludes state payments to unemployment compensation funds.

Reported state-local expenditures in 1913 were nearly  $2\frac{1}{2}$  times federal expenditures minus state-local aid and  $6\frac{3}{4}$  times federal expenditures on internal functions minus aid.

Local government expenditures in 1902 were approximately 7 times state expenditures excluding state aid to localities and in 1913 were 5 times as great, with some local governments not reported. State aid to localities, including grants and shared taxes, accounted for nearly 30 per cent of state expenditures in 1902 and 23 per cent in 1913 but was only about 6 per cent of local expenditures in both years.

The preponderance of functions handled at the state-local level as compared with the federal and at the local level as compared with the state would have been approved by Adam Smith: "The abuses which sometimes creep into the local and provincial administration of a local

and provincial revenue, how enormous soever they may appear, are in reality, however, almost always very trifling, in comparison of those which commonly take place in the administration and expenditure of a great empire." (*Wealth of Nations*, Modern Library edition, page 698.)

#### IV

I shall say little of World War I expenditures, save to note that federal expenditures reached 12.7 billion dollars in 1918 and 18.5 billions in 1919, compared with World War II expenditures of 95.3 billions in 1944 and 98.7 billions in 1945.<sup>4</sup>

But the aftermath of war was apparent after the economy moved into the "normalcy" of the twenties. Wholesale prices in 1925 were up 48 per cent over 1913 and consumer prices, 69 per cent. Federal outlays for veterans' benefits and debt service had greatly increased.

Other influences were operating to increase expenditures, particularly at the state-local level. The 1920 census showed, for the first time, a majority of urban dwellers. The coming of the automobile age necessitated vast road-building programs. The general prosperity—and particularly the rise in the property tax base due to real estate speculation and construction booms—enabled most governments to increase standards of state and municipal living.

Federal expenditures were 3.1 billion dollars in 1925. Per person expenditures were \$26.44—254 per cent above 1913. Per person national defense expenditures (\$5.34) were 106 per cent above 1913, veterans' benefits (\$6.47), 259 per cent, interest (\$7.61), 3,071 per cent, and internal functions, including aid to state and local governments (\$6.89), 148 per cent. Assuming that government unit costs increased commensurately with wholesale prices, the increase in constant-value dollars per person of expenditures other than interest and state-local aid was about 69 per cent; the corresponding increase in internal functions expenditures (excluding aid) was about 47 per cent. Of the total increase in expenditures over 1913, national defense, veterans' benefits, and interest accounted for 77 per cent.

The relative increase, postwar over prewar, of federal government expenditures was considerably greater than the increase in gross national product. Kuznets' figures show an increase in 1925 gross national product over the average of the decade 1904-13 of 195 per cent while federal expenditures increased 375 per cent.

National Industrial Conference Board estimates put "gross" state-local expenditures at 2.2 billion dollars in 1913 and 7.4 billions in 1925. (*Cost of Government in the United States, 1925-1926*, page 9,

<sup>4</sup> Figures for 1918 and 1919 from *Annual Reports of the Secretary of the Treasury*; 1944 and 1945 figures from the *United States Budget, 1951*, Appendix 5.

Table 1.) This is an increase of 230 per cent (computed before rounding expenditure figures), compared with the federal expenditures increase (excluding state-local aid) of 310 per cent, and the increase of 158 per cent in federal expenditures on internal functions (excluding aid).

## V

Nineteen thirty-two found governments at all levels adjusting their finances to combat the impact of unemployment. Federal expenditures, including aid, totaled 4.5 billion dollars—nearly 50 per cent over 1925. Per person expenditures, minus aid, were \$34.42—about 36 per cent over 1925. The increase in internal functions expenditures, however, was greater than the total increase, being offset by a decline in interest payments.

Total 1932 expenditures on internal functions, including aid, were 2.3 billion dollars. The 1932 *Annual Report of the Secretary of the Treasury* set forth in apologetic fashion a list of expenditure increases attributed to the depression, totaling 1.2 billion dollars. These included: RFC capital stock, 500 million dollars; agricultural marketing fund, 136 millions; and public works (increase over 1929), 306 millions. Increased aid to state and local governments, up 110 million dollars over 1929, was not included in the list.

Much of the increase in federal "expenditures" was in setting up loan funds rather than direct purchases or direct transfers with an immediate impact on the economy. Federal purchases of goods and services were only 169 million dollars more in 1932 than in 1929.<sup>5</sup>

Total state-local expenditures in 1932 were 8.4 billion dollars, almost twice federal expenditures (approximately the 1913 relationship). Available data suggest that large-scale relief and other welfare expenditures had just gotten under way. For instance, in New York City, which accounted for over 8 per cent of all state-local expenditures in 1932, per person welfare expenditures were \$2.74 in 1929, \$6.98 in 1932, and \$19.53 in 1940.<sup>6</sup> State per person expenditures for welfare (operations, aid to local governments, and capital outlay) were \$.55 in 1927, \$1.03 in 1932 and \$6.84 in 1939. (*Historical Review of State and Local Finances*, page 21, Table 12.)

Falling prices and declining national income and product gave the increases in government expenditures an economic importance all out of proportion to the absolute amounts involved. Gross national product

<sup>5</sup> Federal purchases of goods and services data from *Survey of Current Business*, July, 1952, pp. 12-13, Table 2. These data are on a calendar-year basis whereas federal expenditure data are on a fiscal year basis; so that the two are not precisely comparable.

<sup>6</sup> Finance Project, Mayor's Committee on Management Survey. *Revenue and Expenditure Trends in the City of New York* (1952), p. 100.



(Commerce estimates) went from 104 billion dollars in 1929 to 58 billions in 1932. (*National Income and Product of the United States, 1929-1950*, 1951 edition, page 150, Table 2.) Prices of goods and services purchased by the federal government fell 11 per cent and those purchased by state-local governments 16 per cent.

Commerce estimates put total government expenditures at 10.2 billion dollars in 1929 and 10.6 billions in 1932. Government purchases in current dollars declined nearly 5 per cent from 1929 to 1932 but purchases expressed in constant-value dollars rose 13 per cent.

## VI

With the multiple relief-recovery programs of the New Deal, federal expenditures (including state and local aid) reached 9.0 billion dollars in 1939, the highest level of the thirties, and nearly double 1932. Of course the spending programs, extravagant as they seemed to many at the time, appear extraordinarily modest now.

Federal expenditures per person went from \$36.33 in 1932 to \$68.51 in 1939. Ninety-three per cent of this increase is accounted for by increases in expenditures on internal functions, and direct relief and work relief accounted for almost 80 per cent of the increase.

Internal functions expenditures accounted for 71 per cent of all federal expenditures in 1939, and direct relief and work relief accounted for 49 per cent of all internal functions expenditures; i.e., of 35 per cent of all federal expenditures.

Data on patterns of state-local expenditure trends during the thirties are incomplete. But they do indicate that expenditures at the state-local level, as well as at the federal level, were dominated by relief and other welfare services and benefits. State expenditures, for instance, increased from 2.7 billion dollars in 1932 to 5.1 billions in 1939. Approximately 32 per cent is accounted for by increased welfare expenditures and 34 per cent by contributions to unemployment compensation funds.

The 1942 state-local government census data, however, show only small increases in per person expenditures over 1932, due partly to declines in capital outlays and interest costs. Total per person expenditures went from \$67.33 to \$74.49, an 11 per cent increase, and operations expenditures from \$44.32 to \$53.58, a 21 per cent increase. State-local spending was restrained, of course, by the shortage of materials and the drain of personnel into the armed forces. Even so, 1942 expenditures were probably as high as 1939, if not higher.

What change occurred in the pattern of state-local expenditures between 1902 and 1942—the year of the last complete census? Per

person expenditures increased from \$12.85 to \$74.49, 480 per cent. Operations expenditures and contributions to state unemployment compensation funds accounted for 84 per cent of the total increase. Two-thirds of the increases in operations expenditures went for schools and libraries, hospitals, public welfare and correction, and sanitation and health. These categories also showed the greatest percentage increases.

But whereas local government expenditures in 1902 were nearly 7 times state expenditures excluding local grants and shared taxes, in 1942 they were only 1.7 times state expenditures. Not only did direct state expenditures increase more rapidly than local, but states financed an increased proportion of local expenditures through grants and shared taxes—28 per cent in 1942 as against 6 per cent in 1902 (computed from *Historical Review of State and Local Government Finances*, page 14, Table 3).

Finally, federal grants were less than 1 per cent of state-local expenditures in 1902 and 8.5 per cent in 1942.

TABLE 6  
INCREASES IN PER PERSON STATE-LOCAL EXPENDITURES, 1902-42  
BY CATEGORIES AND FUNCTIONS

Item	Increase, 1902 to 1942		Percentage of Total Increase Accounted For
	Amount	Percentage	
Total, excluding debt retirement*	\$61.64	480	100.0
Capital outlay	5.43	256	8.8
Interest	2.97	349	4.8
Contributions to trust funds and enterprises	1.55	†	2.5
Payments to unemployment compensation funds	7.99	†	13.0
Operations, total	43.70	442	70.8
			Percentage of Operations Increase Accounted For
Operations, by function	43.70	442	
General control	2.88	139	6.6
Public safety	4.39	357	10.0
Highways	4.51	305	10.3
Sanitation and health	1.84	428	4.2
Hospitals, public welfare, correction	12.04	899	27.6
Schools and libraries	14.89	500	34.1
Recreation	.54	300	1.2
Miscellaneous and unallocable	2.60	1,444	5.9

SOURCE: Computed from Table 5.

\* Figures may not add to totals due to rounding.

† No figures available for 1902.

## VII

The study of federal expenditures since 1939 affords at least one comfort: an orderly functional classification system, first introduced in the 1948 federal budget. I have already mentioned the main categories.

The changes in the pattern of federal finances and their role in the national economy were greater than in any similar previous period. After rising to nearly 100 billion dollars in 1945, federal expenditures dropped by about 60 per cent, ranging from 34 to 40 billions in the period 1947-50, inclusive.

The three years 1948-50, inclusive, were as close to a peacetime economy as we are likely to get for some time. I have compared 1939 expenditures by function with an average of these three years. The 1948-50 average total expenditure per person was nearly 4 times the 1939 figure. Foreign relations and international affairs and security expenditures were 240 times the 1939 figure, national defense  $9\frac{1}{2}$  times, veterans' benefits  $10\frac{1}{2}$  times, and interest 5 times. Internal functions expenditures, including federal aid to state and local governments, increased only 21 per cent, considerably less than the increase in the unit costs of government purchases of 95 per cent. In other words, in constant-value dollars per person, average expenditures on internal functions in 1948-50 were less than two-thirds of what they were in 1939.

But while, on the face of things, expenditures not directly associated with war and defense rose only slightly and in real terms were considerably less than 1939 expenditures, spending on most nonwar-nondefense categories rose considerably more than did costs. The reason for the over-all showing of the internal functions category was the decline of expenditures for direct relief and work relief from \$23.88 per person in 1939 to virtually nothing in 1948-50.

State expenditures rose from 5.5 billion dollars in 1942 to 12.9 billions in 1950, or 134 per cent. Excluding aid to local governments, the increase was from 3.8 billion dollars to 8.9 billions, or 136 per cent. Local aid, including shared taxes, increased from 1.8 billions to 4 billions, or 129 per cent.<sup>7</sup> The most notable increase, considering continued high prosperity levels, was in welfare expenditures. State welfare operations expenditures increased 200 per cent between 1942 and 1950—more than any other operations function except schools. Welfare comprised 29 per cent of all operations expenditures in 1950, compared with 14 per cent in 1942. Total state welfare expenditures,

<sup>7</sup> *Compendium of State Government Finances in 1950* (Census Bureau), p. 6, Table 1. Percentages computed before rounding.

TABLE 7

FEDERAL EXPENDITURES PER PERSON INCREASES, 1939 TO AVERAGE OF 1948,  
1949, AND 1950 BY FUNCTIONAL CATEGORIES

Item	Increase		Percentage of Total Increase Accounted For
	Amount	Percentage	
Military services	\$70.69	859	38
Veterans' services and benefits	40.67	952	22
International security and foreign relations	35.86	23,907	19
Social security, welfare and health, other than relief	7.13	114	4
Work relief and direct relief	-23.84	-100	-13
Housing and community development	2.59	-219*	1
Education and general research	.31	111	†
Agriculture and agricultural resources	4.02	44	2
Natural resources	7.85	451	4
Transportation and communication	6.33	166	3
Finance, commerce and industry	2.05	526	1
Labor	.90	170	†
General government	1.98	46	1
Interest	29.87	415	16
Adjustment to daily Treasury statement basis	.96	-200*	1
Total‡	\$187.35	273	100

SOURCE: *United States Budget (1951)*, Appendix 5; and Table 2.

\* The 1939 figure was a minus quantity, giving a minus sign to the percentage.

† Less than .5 per cent.

‡ Figures may not add to totals because of rounding.

including both operations and aid to localities, increased from 915 million dollars in 1942 to 2,351 millions in 1950.

About 52 per cent of the increase in state welfare costs, however, was offset by increases in federal categorical welfare grants: old age assistance, aid to dependent children, aid to the blind, etc.

Expenditures of cities over 25,000 (1940 population) increased 90 per cent from 1942 to 1950. City expenditures on operations rose 67 per cent.

Assuming the trends of city expenditures to represent the experience of local governments generally, state-local government expenditures can be put at 20.9 billion dollars for 1950—108 per cent over 1942. The estimated per person increase was from \$74.49 to \$138.66, or 86 per cent. Operations expenditures increased from \$53.58 per person in 1942 to an estimated \$94.63 in 1950, or 77 per cent. By comparison, the increase in costs of goods and services purchased, from calendar 1942 to 1950, was 76 per cent. Apparently the level of benefits and services provided by state and local governments, per person, changed very little over the period.

## VIII

With the outbreak of the Korean war and the inauguration of the new defense-security program, federal expenditures again began soaring—to 45 billion dollars in 1951, 66 billions in 1952, and an estimated 79 billions in 1953 (1953 being more than double the 1948-50 average). Of the total increase—1953 over 1948-50 average—93 per cent is accounted for by increased national defense and foreign relations and security programs, 11 per cent by an increase of expenditures on internal functions, and a -5 per cent by a decrease in veterans' benefits. Expenditures on internal functions in 1953 are up 4.4 billion dollars (50 per cent) over the 1948-50 average—an increase as great as the entire increase of federal government expenditures between 1932 and 1939. About 28 per cent of this increase is accounted for by the atomic energy program (classified under natural resources instead of under national defense).

## IX

I turn now to the relationships between national income and product and government expenditures. Here I have relied entirely on Commerce estimates.

Government purchases took 8 per cent of the gross national product

TABLE 8  
PERCENTAGE OF GROSS NATIONAL PRODUCT TAKEN BY GOVERNMENTS  
SELECTED YEARS, 1929-52

Year	All Governments	Federal Government		State and Local	Percentage, Federal Nondefense-Nonsecurity of State-Local
		Total	Nondefense-Nonsecurity		
1929	8.2	1.3	†	6.9	18.3‡
1932	13.8	2.5	†	11.3	22.4‡
1939	14.3	5.6	4.3	8.7	49.4
1942	37.0	32.2	1.6	4.8	34.6
1945	38.5	34.8	.5	3.7	12.8
1948	14.1	8.1	2.2	6.0	35.8
1949	16.9	9.9	2.5	7.0	36.1
1950	14.7	7.8	1.4	6.9	19.8
1951	19.0	12.4	1.3	6.6	19.4
1952*	22.6	15.8	1.6	6.8	22.9

SOURCE: *Survey of Current Business*, July, 1952, pp. 12-13, Table 2, and November, 1952 p. 5, Table 2.

\* First three quarters of year.

† Amounts not segregated.

‡ Total federal purchases used in computing ratio.

in 1929, 14 per cent in 1932, 14 per cent in 1939, 39 per cent in 1945, 15 per cent in 1950, and 23 per cent in the first three quarters of 1952. Since the end of the war, the proportion taken has been running at roughly between 2 and 3 times the 1929 proportion.



Most of the increase, however, is attributable to the defense-security programs and represents the difference between living in a world at peace and one beset by cold and lukewarm wars. Federal purchases for all purposes were 1.3 per cent of the gross national product in 1929, and at least half the federal purchases probably represented

TABLE 9  
DATA ON GOVERNMENT TRANSFER PAYMENTS\*  
1929-50

Year	Federal Government		State-Local Governments		All Governments	
	Including Interest	Excluding Interest	Including Interest	Excluding Interest	Including Interest	Excluding Interest
Amount (Millions of Dollars)						
1929	1,135	694	760	218	1,895	912
1932	1,392	913	1,164	502	2,556	1,415
1939	1,883	1,240	1,834	1,272	3,717	2,512
1942	2,464	1,426	1,708	1,229	4,172	2,655
1945	7,658	4,324	1,652	1,323	9,310	5,647
1948	11,835	7,656	3,162	2,890	14,997	10,546
1949	13,084	8,757	3,155	2,868	16,239	11,625
1950	15,316	10,884	3,711	3,408	19,027	14,292
1951	13,201	8,643	3,196	2,861	16,397	11,504
Percentage of National Income						
1929	1.3	.8	.9	.2	2.2	1.0
1932	3.3	2.2	2.8	1.2	6.1	3.4
1939	2.6	1.7	2.5	1.8	5.1	3.5
1942	1.8	1.0	1.2	.9	3.0	1.9
1945	4.2	2.4	.9	.7	5.1	3.1
1948	5.3	3.4	1.4	1.3	6.7	4.7
1949	6.1	4.0	1.5	1.3	7.5	5.4
1950	6.4	4.6	1.6	1.4	8.0	6.0
1951	4.8	3.1	1.2	1.0	5.9	4.1

SOURCE: Computed from Tables 4, 9, and 36 of Commerce Department's national income and product series, *National Income and Product 1929-1950*, pp. 151, 155, and 201-202, and *Survey of Current Business*, July, 1952, pp. 14-15, 17, and 27.

\* Figures may not add to totals because of rounding.

War and Navy Department expenditures. Nondefense-nonsecurity expenditures in 1950 were estimated at 1.4 per cent of the gross national product and in 1952 (first three quarters) at 1.6 per cent. So while the nondefense-nonsecurity segment now accounts for 2-2½ times the proportion of the gross national product taken in 1929, the present proportion does not evidence any large-scale taking over of the national economy by the federal government.

The proportion of the gross national product taken by state-local governments has stayed in the neighborhood of 7-8 per cent since 1929, except during the early thirties, when it was higher than 7 per

cent, and during the war, when it was lower. The 1929 percentage was 6.9 and the 1952 percentage 6.8.

Despite the general impression of the increasing scope of federal government activities, internal governmental functions are still handled primarily at the state and local government level. State-local purchases in 1950, 1951, and 1952 were approximately 5 times federal purchases for nondefense-nonsecurity purposes. The ratio of state-local to all federal purchases was approximately 5 to 1 in 1929, but approximately half the federal purchases in that year were for defense.

The weight of government is also felt, for weal or woe, in the income transfers effected by government. The proportion of national income transferred (figures outside parentheses exclude and figures inside include debt interest) was 1.0 (2.2) per cent in 1929, 3.4 (6.1) per cent in 1932, and 3.5 (5.1) per cent in 1939. The proportion rose markedly after the war due to the veterans' benefit programs (and increased interest payments): 4.7 (6.7) per cent in 1948, 5.4 (7.5) per cent in 1949, and 6.0 (8.0) per cent in 1950, but fell to 4.1 (5.9) per cent in 1951. In this area the federal government is predominant; it affects about 75 per cent of all transfer payments, or 80 per cent including interest. (Commerce accounts include unemployment compensation benefits with federal transfers; however, including them with state-local transfers does not greatly change the proportions.) Furthermore, it subsidizes the bulk of the transfers made by the states and localities, particularly the categorical relief transfers and the unemployment compensation program and has a good deal to say concerning the administration of those transfers.

Federal grants to state and local governments were 1.5 per cent of state-local expenditures in 1929 and 1.8 per cent in 1932. The proportion went to 10.6 per cent by 1939, largely as a result of the categorical relief grants introduced by the social security programs, and has been in the neighborhood of 10-11 per cent ever since.

In conclusion, the federal government is still chiefly concerned with problems of foreign policy and of past and present wars, while the states and localities are still primarily responsible for financing internal functions. But while the picture of the federal octopus has been greatly overdrawn, its role has expanded greatly since the twenties, relative to both the economy at large and the role of state and local governments. And the increase of the federal government's influence has been far greater than the figures on direct expenditures indicate. Through controls over subsidized programs, its influence extends to state-local expenditures of revenues they raise themselves—notably in the case of the welfare and unemployment compensation programs.

Of course, much of the protest against federal "interference" comes

from local politicians and administrators indignant over federal insistence on maintaining at least minimum administrative and civil service standards. But there are grounds for legitimate protest against lack of administrative flexibility and red tape required by federal regulations in connection with many of the programs in which the federal government participates. And there is still the great question of how far the federal government should go in inducing states and localities to undertake programs which they would not be disposed to undertake by themselves, whether the inducement take the form of near coercion, as with the unemployment compensation program, or more subtle forms, as with contingent matched grants.

But perhaps the most important conclusion indicated by a review of trends in governmental expenditures is that, avoiding war, the broad basic choices appear still to be open. So far as our nondefense expenditures are concerned, the statistical record reveals no inevitable march to state socialism, or even to the abandonment of that decentralization which, over a century ago, de Tocqueville regarded as one of the striking virtues of American society. Clearly, the greatest threat to the free economy is the same as that to civilization itself: war, probably even war with victory and certainly war and defeat.

## DISCUSSION

RONALD H. COASE: The best critics of a paper are those who are, broadly speaking, in sympathy with the approach of the author. But it so happens that I find myself rather lukewarm towards the approach used by Professor Abramovitz; that is, an examination of the problems of government economic activity through a study of government employment. In consequence, while I admire the skill with which the task has been performed, it is, I am afraid, inevitable that my comments will do less than justice to Professor Abramovitz' contribution.

I can put my own point of view by making certain assertions about government employment: (1) it does not measure the influence which the government exerts on the working of the economic system; (2) it does not measure the resources which are devoted to governmental purposes; (3) it does not measure the extent to which the economic system is planned; that is, the extent to which market forces have been superseded; and (4) it does not give us any measure of the movements of opinion on the question of public versus private enterprise. I should, of course, make clear that when I say that government employment does not measure something, the qualification, "except with a wide margin of error," may be assumed.

May I expand a little on each of these assertions?

A government can exercise considerable influence on the working of any given part of the economic system without employing a single man. For example, the Chancellor of the Exchequer used to see the Governor of the Bank of England periodically in prenationalization days and it seems to be agreed that normally the Bank carried out the government's wishes. And since the commercial banks co-operated with the Bank of England, the influence of the government on banking policy was obviously considerable. When you have a compliant business community, as in Britain, the government can exercise great influence without corresponding government employment. Indeed, it is one of the paradoxes of the situation that nationalization seems to have made the industries more independent in their attitude to the government than they were before. I am quite certain that the nationalized public utilities have been able to resist various government demands in a way in which a privately operated industry could never have done. To return to our banking example, I am told (I have no first-hand knowledge) that the Bank of England is now more independent in its dealings with the Treasury than it used to be. Even in those cases in which the government does not take over the whole industry, the fact that it operates part and may therefore be regarded as a competitor may weaken its moral authority and therefore its influence over the privately operated sector; and this needs to be taken into account if we are to assess the net effect.

My second assertion was that government employment does not measure the resources devoted to governmental purposes. Professor Abramovitz would

probably agree with this, although what he says sometimes seems to suggest the contrary. I suspect he had forgotten this when he attaches significance to the ratio of numbers in the armed forces to civilian (government) employees engaged in defense work. These employees are presumably those engaged in the Admiralty dockyards, the Royal Ordnance factories, the Army storage depots, and similar establishments. Now these employees are in part doing work carried out by members of the armed forces themselves and in part doing work done (my guess would be mainly done) by private contractors engaged in defense work. The number of civilian employees in defense work is subject to pressures from two directions, and I am doubtful whether any general significance can be attached to the ratio of these employees to the numbers in the armed forces.

There has been extensive planning in Britain but much of it may be termed planning by the trade association. In consequence, controls or even nationalization may have real effects less important than might appear on the surface (or that one might infer from government employment statistics). Whether the trade association officers are sitting in offices in the Strand or in Whitehall may not always have any considerable effect on their actions. You may remember that Keynes, in "The End of Laissez-Faire," speaks of the tendency of private enterprise in Britain to socialize itself. He concluded, among other things, that there was "no so-called important political question so really unimportant, so irrelevant to the reorganisation of the economic life of Great Britain, as the Nationalisation of the Railways." Perhaps Keynes exaggerated; but he illuminated, as always, part of the truth.

It is, I think, easy to see that movements in government employment do not reflect, except in a very indirect fashion, changes in opinion on the question of government intervention in industry. Whatever the general view may be, there are always counterforces to be overcome, and the influence of opinion on action must await the opportunity and the coming into positions of influence of people sufficiently vigorous to push a scheme through. That one industry has been taken over by a public authority before another has therefore often been due to quite accidental factors. Nonetheless, Professor Abramovitz does make some statements about the forces bringing about the increase in government employment. He tells us that the growth of government employment is "a reflection of the problems engendered by industrialism and urbanization." I would prefer to say that, the armed forces apart, the increase in government employment is a result of the fact that there has been a tendency to choose one particular solution to these problems; namely, government operation. If we are to explain the movements in government employment, we have to discover the reasons which led people to select this particular solution as against others. Professor Abramovitz is also inclined to ascribe the growth in government employment to the transfer of political power from the rich to the poor. There is no doubt something in this argument but its importance can, I think, be exaggerated. I believe that there is greater homogeneity in opinion between classes than is sometimes thought. It is well to bear in mind that "the rich are only the poor with money." I would point out that government intervention has been carried out by Conservative gov-



ernments on occasions when the decision to do so could have had no political repercussions of any significance.

I should like to make it clear that I have no objection to the collection of statistics. I think it would be most convenient to have a source book of statistical series on employment in the public service in Great Britain. My objection is to the speculation to which Professor Abramovitz has been led through the contemplation of his figures. I do not know what Professor Burns feels about the complaint that a National Bureau study has too much analysis in it, but at any rate he may appreciate the novelty of the situation.

Perhaps one of my troubles is that I resent the intrusion into the discussion of government economic activity of the methods of aggregate economic analysis. Professor Abramovitz at one stage even presents us with a government employment function: the relation between government employment and income per capita. This is presumably to be the companion to the stable consumption function. It is true that Professor Abramovitz refers to the crudity of this function. But it was not so crude as to be erased from his paper and he states earlier that "it would be surprising if it did not contain a considerable measure of truth." I get the impression that Professor Abramovitz feels that he may be able to refine the function with the aid of another variable or two. My own view is that the growth in government employment (the armed forces apart) is largely the result of the opinions people in authority have come to hold on the proper organization of industry—the question of public versus private enterprise. These opinions are the result of many influences, of which I would have thought per capita income was one of the least important.

But this grumbling must be getting tedious and I shall now bring it to an end. However, I would not wish to close without remarking to Professor Abramovitz that he can afford to be tolerant of these criticisms, hostile though they may have appeared. The critic is inevitably in a somewhat unenviable position. One has to recognize that in our life all glory goes to the creator, even though it is the critic who is right. For it is the creator who carries with him the seeds of human progress. No doubt there were those who pointed out that the early flying machines suffered from the defect that the machines did not fly. But if there were, we do not hear of them and we read with admiration of the work of those whose spirits soared even though their contrivances never left the ground. I mention this because I am compelled to say that Professor Abramovitz' flying machine does not fly.

M. SLADE KENDRICK: Dr. Fitch's paper deals with the expenditures of government in the United States and that by Professor Abramovitz and Vera Eliasberg with the persons employed by government in Great Britain and the United States. Thus the one measure of the growth of governmental activity is dollars paid out and the other is labor resources absorbed. Both treatments are scholarly—indeed so full of facts and ideas as to make selection for discussion difficult.

At the beginning of his analysis, Dr. Fitch called attention to the variables affecting public expenditures. Among them he listed the size of the population and the amount and the cost per unit of the benefits and services provided for

each person. Growth in the national income or product he held to be an indirect influence tending to increase public expenditures. But he found the effect of these variables impossible to measure. Increases in population, for example, might, under some circumstances, lead to a less than proportionate addition to expenditures for police and corrections and under others to a more than proportionate one. The distribution of the increases, he also pointed out, is to be considered in any appraisal of their effect. A greater variety of services is required by an urban community. He doubted whether the adjustment of expenditures by a consumer price index necessarily corrects for changes in prices paid by the government, and in an example showed how the rates at which public employees are compensated might increase less than the index of consumer prices. Nevertheless, in the absence of a suitable index, he was willing to do the next best thing; namely, to utilize the available one. Likewise, by reducing expenditures to the per capita amounts, he would adjust for variations in population.

In the main, I find myself in agreement with Dr. Fitch's qualifications of the devices used to make the public expenditures in one period comparable with those in another. But I think I should add at least one or two items to his list of factors affecting public expenditures. War exerts an immense influence on federal expenditures, not only during the fighting, but afterward. I believe, too, that changes in the social and economic order create problems the answers to which are often sought in enlarged public services and therefore expenditures. Thus the development of the automobile and its acceptance by the American public led to a demand for improved public highways that were much more costly than those needed for horse-drawn vehicles. The change from a largely self-sufficient to a commercial agriculture underlies the present emphasis on a satisfactory return to farmers for their products and therefore the large public expenditures toward that end.

The relation of the gross national product to public expenditures is not consistent. A rising trend favors an expansion of public services and hence higher expenditures. On the other hand, the swift downturn during a depression may also bring about an increase in public services and in their costs. At least this was true during the thirties.

For federal expenditures, Dr. Fitch used the annual report of the Secretary of the Treasury through 1938 and afterward the Budget of the United States Government. In the latter part of his study, therefore, he was enabled to take advantage of the more detailed and more accurate functional classification. For state and local expenditures reliance was placed on census data.

Anyone who makes a historical analysis of federal expenditures is impressed by the difficulty of obtaining satisfactory data. Dr. Fitch's use of the budget concept of expenditures gives a certain consistency to the sources of his material. On the other hand, intragovernmental transfers, trust fund, and non-cash expenditures were much larger in the latter part of the period covered by his study than in the earlier. The budget treatment of these items is not satisfactory. The social security trust funds provide an illustration. The tax collections under the Federal Old Age and Survivors program are appropriated directly to the insurance trust fund. Thus neither their amount nor the sum

of annuities to retired workers appears in the aggregate of public expenditures. But the tax collections for retired railroad workers are regarded as money in the Treasury. Hence their appropriation to a trust fund is considered to be an expenditure.

It seems to me that for the latter part of the period there are advantages to using cash payments to the public. These figures, which are of governmental expenditures on a consolidated basis, have been published back to 1929. True, their use, except in recent years, would raise a problem of how to determine the component items, because only the totals of cash payments are available. But assuming that Dr. Fitch wished the budget concept to underlie all his data on federal expenditures, I wonder why he did not make more use of the functional classification. The chief categories are available at least back to 1915.<sup>1</sup> It is, however, only fair to say that the principal trends examined in Dr. Fitch's paper would in all probability not have been altered in any significant respect by reliance on different sources.

These trends are shown by periods. From 1890 to 1913, he points out, federal expenditures other than interest, when expressed in stable dollars per person, increased by about 29 per cent and the gross national product increased more. But the Spanish-American War came in the midst of that interval and elevated public expenditures somewhat in the ensuing period of peace as compared with their prewar level. My own studies for the National Bureau of Economic Research, made on the same basis, which are in agreement with Dr. Fitch's on the increase between 1890 and 1913, show that federal expenditures declined slightly between 1900 and 1916. Here I should like to remark parenthetically that an examination of the history of federal expenditures discloses a number of other periods of stationary or declining federal expenditures. Wagner's so-called "law" of increase of state activities, as applied to the central government, finds little support in American experience.

Returning now to Dr. Fitch's paper, I could not but note his comparison of state and local expenditures with federal expenditures on internal functions. This comparison is much more fruitful than the usual one of totals. State and local, which in 1890 were nearly 5 times federal, were  $6\frac{3}{4}$  times in 1913.

By 1925 federal expenditures, owing to the aftereffects of the first World War, had increased again and significantly over their level in 1913 and had grown more than the gross national product. Another increase appeared in 1932 and still others through 1939. Ninety-three per cent of the large growth of expenditures over this period was explained by the increased costs of internal functions, particularly of direct and work relief. In this striking way, Dr. Fitch indicates the effects of the depression.

The next census report on state and local expenditures was in 1942. Increases over 1932 were moderate. Great gains, however, appeared over 1902, the last complete census. To-thirds of the increases in the cost of operation were for schools and libraries, hospitals, public welfare and correction, and sanitation and health. Thus the broader social services received more emphasis than the traditional functions. Another noteworthy development was

<sup>1</sup> *Congressional Record*, 80th Cong., 2nd Sess., Vol. 94, Part 2, p. 2576.

the shrinkage of local government in comparison with state. In 1902, local expenditures were 7 times state, excluding local grants and shared taxes. But in 1942 local units spent only 1.7 times as much as the states.

Federal expenditures were much larger in the interval 1948-50 than in 1939. The great increases, however, were in national defense, veterans' benefits, foreign aid, and interest. Because of the virtual cessation of relief activities, expenditures for internal functions were only 26 per cent more than in 1939, and in stable dollars per person only two-thirds as much. State and local expenditures had increased substantially by 1950 over 1942, but allowance for the growth of population and the rise in prices practically canceled the gain.

The significance of the federal government in the economy, as measured by the ratio of purchases to the gross national product, has increased manifold. In 1929, federal purchases were 1.3 per cent of the gross national product; in 1952 (third quarter) 15.8 per cent. The proportion of state and local government purchases, on the other hand, remained stable over the period. It was 6.9 per cent in 1929 and 6.8 per cent in 1952. The purchases of state and local governments, however, were 10 times as large in 1929 as were federal purchases for internal functions only. They were 5 times as large in 1952. Thus despite the immense growth of the federal government, by far the greater proportion of public goods and services for internal use is still supplied by the state and local governments. Dr. Fitch qualifies this result by pointing to the growth of federal transfer payments, some of which are grants with conditions attached. By such means the influence of the federal government over state and local functions is much more than the comparative figures on expenditures would suggest.

I turn now from this interesting paper to consider that by Professor Abramovitz and Vera Eliasberg, in which trends are measured in the number of government employees in relation to the working population. The major portion of their study traces the expansion of public employment in Great Britain from 4 per cent of the labor force in 1891 to 14 per cent in 1950. In the minor portion, comparisons are made with the growth of public employment in the United States.

Since the labor force in Great Britain increased over the entire period from 14.7 to 23.1 millions, the gain in government employment was much more than is indicated by the ratio of 14 to 4. It was actually 450 or 500 per cent. During the sixty years, more than 30 per cent of the additional labor force went to work for a government agency, and in the latter part, from 1931 to 1950, more than 60 per cent. In 1900 as in 1949, the British utilized a greater proportion of their labor force in public employment. But the ratio of the American proportion to the British remained almost exactly the same: 88 per cent in the one year and 89 per cent in the other. The increase, however, in the number of civilian employees in relation to the working population was much more in Great Britain than in the United States. These are among the more important conclusions of the paper.

A feature of the treatment that excited my interest was the wealth of interpretative material. Thus the great expansion in public employment in Great Britain after 1890 was shown to have been the outcome in part of develop-



ments during the preceding hundred years. The contraction in public employment by the central government after the first World War was explained as the net result of liquidating the regulatory agencies and of expanding the social departments. The increase in public employment after the second World War was accounted for by the growth of both types of agencies. And the relatively more rapid early expansion of local government was explained by the appearance of problems with which local authorities had to deal.

Figures on public expenditures or employment become more meaningful when viewed as the expression of public services or goods. But these are still not the fundamentals. We must ask why the services were rendered or the goods provided. The answers, I think, are for the most part to be found in the problems arising from social and economic changes. In my opinion, studies of public expenditures or employment should give more attention to the underlying alterations of a developing society and the problems that emerge from them. Only by so doing can we hope to arrive at a sound theory of public expenditures.

THEODORE C. MESMER: The papers presented reflect careful and skillful handling of difficult statistical materials and deserve a warm reception. They also suggest some broad propositions concerning the role of government in the economy. These propositions in turn imply the need of redirection and re-emphasis in the study of public finance.

I must confess that my enthusiasm is partially that of one who hears friendly voices while traveling in what he had imagined to be lonely territory; for I have also been attempting to measure governmental growth by a different and essentially cruder method than that used by Drs. Abramovitz and Fitch. They have made case studies of the fifty-year growth in government in two of the most developed countries in the world. They have relied upon government employment and government expenditures data, in the United Kingdom and the United States, respectively, to measure this growth. I have been interested in making comparisons in the scope of central government activity in countries at different levels of economic development at a point in time. Specifically, I have taken ratios of central government expenditures to national income in some forty-five countries—the data being generally based on the immediate postwar period 1946-49—and then compared these ratios to various real indicators of economic development; e.g., the percentage of the labor force engaged in primary and tertiary production and the degree of urbanization.

The results of such a cross-sectional study support the general tenor of the two main papers which is that governments experience a relative growth as the economy develops. Economic development, with its associated urbanization, industrialization, social complexity, and interdependence, seems to lead to the extension and intensification of governmental activities on all levels. This is a proposition that seems to apply not only to the United Kingdom and the United States but to many other countries as well. Even the more rapid expansion of civilian government employment in the United Kingdom than in the United States which was noted by Dr. Abramovitz is compatible with the



hypothesis that government grows relative to the development of the economy if we are careful to measure development by some statistical indicator having a more direct and tangible relationship to collective needs. The degree of urbanization, for example, would seem to be more appropriate than income per capita measures. There is no reason to believe that the higher standard of living (or income per capita) of the American urban worker relative to his British counterpart would make him more susceptible to a collective solution to his problem of providing health services, for example. On the contrary, this extra cushion may make a private solution more acceptable.

In addition to the basic generalization that government tends to increase relatively as the economy develops, a subproposition may be ventured with respect to changes in the internal composition of nondefense governmental activity. Both Abramovitz and Fitch noted a shift in emphasis in favor of the social service functions during the half century in question. This again is supported by country comparisons. In a sample of thirty countries, the significant difference in the percentage composition of central government nondefense expenditures in fifteen developed and fifteen less-developed countries was the greater percentage share of the social service expenditures in the developed countries.

This kind of study raises certain problems of technique. These problems often relate to the proper measure to employ in tracing governmental growth and the point at which numerical measurement becomes inappropriate.

I would prefer to trace growth through the expenditures data found in budget accounts. A budget is not only a record of public financial operations. It is also an end product of a political process which in turn reflects imperfectly, and perhaps with a persistent lag, social problems in the community at large. At present when asked for causes of growth we can only refer generally to urbanization, industrialization, awakened social responsibility, etc. One possible way of clarifying these cause and effect relationships would be to study these expenditures in reverse: first as they appear in social pressures in the community and later as legislative bills-in-the-hopper; and to combine this analysis of social and political antecedents with the kind of statistical analysis of the consequences of the passage of the budget which are reflected in the two papers.

I also feel that in this kind of investigation we must take care to recognize the point at which our economic analysis relying on numerical measures should give way to the more qualitative techniques of the political scientist. The problems relating to the efficiency of government employees and operations or to the coefficients of graft applicable to government growth are probably more amenable to qualitative analysis, particularly in light of the information provided us by the traditional political remedies for such abuses.

These, however, are minor differences in method. The continuing task of documenting governmental growth will necessarily use a variety of techniques, depending upon the availability and accessibility of data and other particular circumstances in the country under study. The studies in governmental growth have, I believe, some rather serious implications for students of public finance.

If it is true that the fundamental proposition of public finance is that government expands in response to the demands and needs of urban industrial society, then is it not true that in our persistent preoccupation with tax questions in the past fifty years we have been continually dealing with the secondary consequences of the expansion of public services while at the same time neglecting the causes and patterns of growth? It is entirely possible that we live in a world in which taxes tend to be expenditure-determined. Social problems tend to be reflected first in the growth of governmental activities, and considerations of revenue are often in the nature of an afterthought.

The more recent attention given to fiscal theories of the Keynesian variety has tended to emphasize government as a kind of balance wheel designed to cope with short-run cyclical problems relating to the maintenance of income and employment and have largely ignored the growth tendencies discussed in these papers. More serious perhaps has been the tendency to obliterate the social and political ramifications of both expenditures and revenues in fiscal policy formulations. There is an air of unreality surrounding theoretical systems in which government expenditures and taxes are represented simply by the aggregate symbols  $G$  and  $T$ .

It may be proper, therefore, at this time to channel some of our efforts into the study of government as it is related to economic growth; for it is in these patterns of growth that we find mirrored the vital public issues of the day.

## DEVELOPMENT OF ECONOMIC THOUGHT

### PATTERNS OF ECONOMIC REASONING

By KARL PRIBRAM

Washington, D.C.

Whoever embarks on the study of the history of economic thought is faced with the question of explaining why the meanings of commonly used terms vary so greatly as between the different schools—why some concepts and problems which are of fundamental importance for certain schools are irrelevant or at least hardly significant for others.

There is hardly any doubt in my mind that in many cases varying definitions of economic concepts are due to the pervading influence of conflicting methods of reasoning or patterns of thought.<sup>1</sup> Each pattern causes its adherents to adopt a specific approach in formulating and solving their problems. Viewed from that angle, the history of economic thought, reflecting the general development of Western reasoning, is largely a history of applied logical procedures. That proposition may be contrasted with the widespread view that the development of economic thought has been strongly influenced by the changing structures of economic life and the related view that many, perhaps all, economic doctrines reflect in their essential aspects the material interests of specific classes of the population. Such relationships may be found to obtain in certain cases; but their importance is hardly significant when compared with the control exercised by the modes of thought which have alternatively determined the character of the prevailing thinking processes.

In order to facilitate the difficult task of conveying a clear distinction between different methods of reasoning and of arranging schools of economic thought accordingly, I should like to start with a discussion of the divergent meanings attached by the various schools to a general concept which has been fundamental to economic thinking of all types: the concept of economic system or economic model; that is to say, the set of principles used by an author or a school for combining economic relationships into a more or less unified and coherent picture. The system concept adopted by a school reveals the basic logical rules observed by its adherents in defining, co-ordinating, and

<sup>1</sup> See the author's *Conflicting Patterns of Thought* (Washington, D.C., 1949).

integrating the elements of economic life considered relevant for the understanding of any economic relationships and processes.

In accordance with the rules of reasoning which the nations of Western Europe had inherited from the Greek classical philosophers, two conflicting system concepts were competing with each other when the first attempts were made to transform the perplexing variety of economic happenings and events into simplified pictures. The schools whose adherents believed in the power of reason to grasp reality and fully to understand the teleological aspects of economic life were inclined to adopt an organic concept which could be easily combined with the belief in immanent ends of various human collectivities.

Other schools, however, that did not believe in the power of reason to teach us the essence of things and their real meaning, that ascribed to reason only the faculty to formulate the hypothetical conditions under which causal relationships between outside events could be assumed to exist, decided upon the use of mechanical system concepts.

The choice of a rudimentary concept of mechanic economic system by the English mercantilists of the seventeenth century has been among the most amazing and momentous events in the history of Western thought. It has determined the development of the reasoning of the Ricardian, post-Ricardian, dialectic, and marginalist schools to such extent that the history of these schools can almost be identified with the history of the changes which in the course of two centuries were made in incessant attempts to apply mechanical principles to the construction of economic system concepts. Particularly remarkable have been the various efforts to transform a rigid equilibrium concept into a more flexible tool of economic analysis fit for coping with the dynamic nature of economic events and processes.

The adherents of the German historical school and the followers of similar intellectual movements, however, repudiated the use of mechanical principles for purposes of economic analysis and made continued efforts to construct organic concepts of social collectivities to which biological characteristics were applicable. Thus national economies were quite commonly conceived as integrated wholes. A sort of intuition was used—consciously or implicitly—for interpreting the relationships between the parts and the whole of such organic collectivities, and the diversity of imaginative intuition was reflected in the variety of definitions and explanations advanced by members of the school for characterizing national economies.

Far more carefully devised than the various concepts of organic system was the dialectic concept used by K. Marx for evidencing the inevitable breakdown of the capitalist order. Although one might expect that only an organic concept was compatible with the evolution-

any aspects of dialectic reasoning, Marx availed himself of the hypothetical, atomistic mechanic system concept of Ricardian economies as a starting point, but transformed the equilibrating tendencies operating within the Ricardian system into mutually antagonistic forces working in reality towards the disruption of his system. A machinery the operation of which was determined by so grossly disparate elements could not function at all, and the main task of the Marxian analysis did not consist in demonstrating the necessity of the collapse of that machinery; that necessity was logically implied in the construction of the system. What Marx had to explain, and what he could not explain, was the functioning of a fundamentally mechanical system in which disequilibrating tendencies were continuously operating.

Thus, when economic reasoning unfolded in the course of the nineteenth century, at least three radically different concepts of economic system were being applied: an organic, a mechanic, and a dialectic. They provide an adequate basis for a first general classification of economic doctrines. Subdivisions can be established by differentiating various versions of these system concepts.

In order to clarify the connections which have existed between the development of economic thought and the general history of Western reasoning, it appears appropriate to extend our discussions beyond the pales of economic analysis strictly speaking and to refer to some meta-economic concepts which have played important roles in determining the formation of economic systems. The meta-economic concepts which I have in mind have been borrowed from other sciences or from popular reasoning and have subsequently been adjusted in varying degrees to the purposes of economic analysis. I have selected five such concepts which have played outstanding roles in the history of our science: the equilibrium concept, the maximization principle, the notion of time, the idea of freedom, and the conception of law. The meaning of each of these notions has varied widely according to the methods of thought which have supplied the logical setting for their definitions.

### *The Concept of Economic Equilibrium*

The importance of the equilibrium concept for the development of Western thought has been so great that one might be tempted to include the concept—at least in a rudimentary form—among the self-evident synthetic categories of our process of thinking were it not for the fact that mechanical ideas have been practically ignored by the peoples of the Far East before they came into closer contact with the Western World.

Led by St. Thomas Aquinas, the Schoolmen of the later Middle Ages elaborated an economic doctrine which was largely derived from



Aristotelian views. The equilibrium concept appeared in the form of equivalence, and the normative connotations implied in the idea of equivalence permeated all Scholastic economic precepts: what was given should be equal in intrinsic value to what was taken. That maxim was reflected in the concept of just price and just wage, of money, in the ideas of commutative and distributive justice, and in the prohibition of usury.

It is not necessary to discuss in this connection the remarkable phases of the prolonged logical struggle waged mainly in Italy and England during the mercantilist period against the principles of Scholastic reasoning. In the course of this struggle, reason was deprived of its predominant position as a reliable instrument of discovering the truth with the aid of absolutely, eternally valid concepts. Instead, emphasis was placed on the function of individual wills in organizing human collectivities in accordance with the interests of the individuals. The utilitarian principle which made its appearance had been anathema to the Scholastics.

In a world in which reason was not any longer relied upon to teach the rules of lawful and just behavior, a purely mechanical equilibrium concept borrowed from the natural sciences was resorted to in order to establish a firm starting point for an understanding of the relationships of economic phenomena. The equilibrium concept appeared in various rudimentary forms: in the form of the proposition that what was somewhere gotten was somewhere lost; in the application of the balance idea to the measurement of gains and losses in foreign trade and to the explanation of prices in accordance with the quantity theory of money. More refined uses made of the equilibrium concept led to the proposition that prices tended to be equal to cost and to the analysis of the international distribution of monetary metals in terms of the simile of the behavior of liquid in communicating vessels. Eventually that process culminated in the conception of a hypothetical economic system as an equilibrated mechanism and in the elaboration of all conditions which were needed for assuring the operation of that mechanism.

It is very likely that the application of the equilibrium concept to the construction of an economic system has provided a way of escape from the hopeless undertaking to devise an economic system which would have included among its logical premises all the uncertainties and risks confronting an individual's economic behavior under the competitive order.

Three important consequences followed from the construction of a mechanical economic system: First, that the system was to be conceived as a self-regulating mechanical relationship of magnitudes to be reduced to a common denominator, a standard unit of value. Second,

the belief that, if the system tended to maintain all its constituent elements in general equilibrium, noninterference with its functioning was the best method of assuring the most beneficial effects of individual economic activities. Thus, regardless of the philosophical utilitarian origin of the idea of free competition and its blessings, that idea received strong support from the mechanistic construction of the economic system. Finally, since such a mechanistic construction was inapplicable to any other spheres of human activity, analysis of the economic system could be completely divorced from the discussion of other sectors of social life and the search for laws of causality could be made a main object of economic analysis.

That rigid equilibrium concept which required reduction of all elements of the economic system to a common denominator, an objective standard unit of value—as distinct from fluctuating prices—dominated Anglo-Saxon economic reasoning almost until the end of the nineteenth century. Phenomena which were incompatible with the assumed self-regulating tendencies of the system were held to have been caused by forces operating from outside the system and, consequently, were placed beyond the reach of the economist's reasoning.

A new chapter started in the history of the equilibrium concept as applied to economics when the labor cost theory was superseded by the theory of subjective value. The emergence of marginal utility analysis signified a victory of hypothetical reasoning in the fight against the substance concept of the goods and the traditional Scholastic belief that the value of a good must be conditioned by some quality inherent in the good. On the other hand, the application of the equilibrium concept to the system as a whole met with extraordinary logical difficulties when two fundamental assumptions of Ricardian economics had to be abandoned: that all exchange values could be reduced to a common, invariable denominator, a standard unit of cost, and that equal values were exchanged against each other in each exchange transaction. Instead of starting from the search for forces tending to maintain the balance of the system as a whole, marginal utility reasoning requested it adherents to start on the assumption that every individual permanently tended to equalize his marginal utilities and thus to keep in balance his entire system of want satisfaction; that, moreover, on the supply side each producer continuously performed a corresponding balancing process by continuing his production up to the point at which his returns and the marginal productivity of his resources were equalized.

The differences which developed between the mathematical and the psychological versions of marginalism were reflected in divergencies made in the use of the equilibrium concept. Motivated by the desire to

apply series of simultaneous equations to the analysis of their hypothetical economic systems, the adherents of mathematical economics did not hesitate to assume indefinite divisibility of goods and utilities, interpersonal comparability of utilities, and similar fictitious devices. A substantial array of these and additional fictions were introduced by Walras into his bold construction of a perfectly equilibrated system; other somewhat less extravagant fictions were used in other versions of marginal utility analysis.

The followers of the psychological school, however, never came under the spell of the rigid Ricardian equilibrium concept. They regarded utilities as nonmeasurable and indivisible stimuli of demand and did not even look for a method fit for reducing marginal utilities to mutually comparable magnitudes. Böhm-Bawerk made the equilibrium of the economic machinery dependent upon the maintenance of the equilibrium rate of interest as the strategic factor operating toward the mutual adjustment of the various productive processes. Thus he was among the first economists who emphasized such adjustment over time as an indispensable element of securing the equilibrium of the system.

It is well known how Knut Wicksell developed these ideas and ultimately substituted for the Ricardian rigid equilibrium concept another concept which proved to be a far more flexible instrument of economic analysis. He made the stability of the system dependent upon the coincidence of the real rate and the market rate of interest; he established a new monetary equation which identified that part of the national income that is not saved with the total volume of goods of consumption multiplied by their prices. Thus he questioned the classical myth that money was simply a veil to be lifted in order to understand the functioning of the economic machinery. He pointed to expectations as an important element in determining employers' decisions. Finally he suggested even the existence of two economic systems with different equilibrium conditions—a system of productive operations and a monetary system—and attempted to define exactly the equilibrium conditions of the monetary system. Thus he outlined the equilibrium problems which were elaborated by his Swedish disciples and provided the framework for the development of the Austrian business cycle theory.

Another attempt to take account of the time factor in devising a more flexible equilibrium concept than that used by the Ricardians was made by Schumpeter, who transformed the Walrasian system into a system of moving equilibrium positions. The forces operating within that system were arranged in accordance with a sort of dialectical scheme.

Business cycle analysis of the interwar period was largely influenced by the idea that the disruptions of the equilibrium of the economic system were caused by the alternative expansions and contractions of the means of payment. A new formulation of the equilibrium aspects of the economic system was advanced by Keynes. He placed great emphasis on the lack of any connection between the propensity to save and the propensity to invest and dropped the Ricardian assumption that there exists for the economic system a tendency to establish its equilibrium at a level of full employment of the available resources. He requested the development of a theory of shifting equilibrium designed to analyze a system in which changing views about the future are capable of influencing the present situation. Thus the Keynesian theory marked another step in the development of a doctrine which started from the Ricardian equilibrium system and advanced by removing one after another the assumptions which Ricardo had made in order to justify the application of equilibrium analysis to an imaginary real exchange economy operating independently of the influence of money and credit.

The American Institutionalists—who hardly can be said to have formed a coherent school—occupy a separate chapter in that history. They refused to apply the equilibrium concept and other concepts of high abstraction to economic relationships; since, on the other hand, they did not adopt the methods of organismic reasoning proclaimed by the German historical school, they did not develop any clear concept of economic system.

The Ricardian mechanic conception of the economic machinery was also responsible for a considerable number of socialist doctrines designed to evidence the existence of mutually antagonistic, disequilibrating forces operating within the capitalist economy. That was, above all, true of the Marxian doctrine, which emphasized disproportionate expansions of the various sectors of the economy as the source of continuously intensified disequilibria. In contrast to the alleged behavior of the capitalist economy, a definite equilibrium concept appears to have been introduced into Bolshevik reasoning. Stalin's scheme of abolishing private property of land and of mechanizing agriculture was explicitly motivated by the intention to establish, as quickly as possible, the equilibrium between agricultural and industrial production.

### *The Maximization Principle*

Next to the equilibrium principle in its various forms the idea of "maximization" has been an important meta-economic logical category—frequently intimately connected with the equilibrium concept through



the proposition that what was to be maximized was a share in a limited supply. In that case the share of any partner could be increased only at the cost of others. Thus the economic policy of striving for export surpluses as pursued in the mercantilist period was suggested by the belief that the total volume of wealth available for all countries and embodied in the precious metals was a given, more or less fixed, magnitude; so that any gain in the struggle for wealth and power could be secured only at the expense of other competitors.

Subsequently, after general relative scarcity of goods had been recognized as a factor which was fundamental to any economic considerations, the idea of maximization provided a "rational principle" to quite a number of economic doctrines; that is to say, a principle which, when generally observed, could be assumed to assure the smooth functioning of the system envisaged by the doctrine. Especially did the doctrines that questioned the power of reason to establish absolutely valid rules of social behavior resort to the formal maximization principle which appeared to provide an objective, measurable goal for individual and collective actions. The classical instance in point was the utilitarian philosophy which made striving for the satisfaction of self-interest the guiding principle of human behavior and elevated the principle of maximizing happiness to the rank of an incontestable ultimate end. Simultaneously the apparently insoluble problem of how to transform happiness into a measurable magnitude was approached from the economic angle. Striving for maximization of earnings in form of exchange values could be established as a rational principle of economic behavior if it could be shown that pursuance of that objective was consistent with the interest of others and those of the community. That problem was answered by Adam Smith to the satisfaction of his contemporaries. In Ricardian economics maximization of gains was transformed into maximization of the individual shares in a national dividend which was assumed to consist of a more or less fixed volume of exchange values expressed in units of labor costs. There is no doubt that the use of the maximization principle contributed greatly towards transforming economics into an exact and a dismal science. Among the psychological and economic magnitudes which on different occasions were suggested as objects of maximization were the utilitarian categories of pleasure, happiness, want satisfaction; the marginist categories of utility, ophelimity, social utility; and the economic categories of welfare, real income, national income, profits. Even after the intimate connection between the utilitarian philosophy and equilibrium economics had been significantly reduced, the leading Anglo-Saxon schools of economics, headed by A. Marshall



and J. B. Clark, maintained, on the whole, the Ricardian setting of the maximization problem.

The members of the German historical school, who abhorred the idea of quantifying economics, returned more or less explicitly to the mercantilist idea of the struggle of the world powers over their shares in the world markets. In the Marxian analysis of the capitalist economy striving for the maximum possible gain was presented as a sort of original sin of the capitalist employer and combined with an alleged uncontrollable passion of the capitalist for maximizing the accumulation of capital and for investing it in productive processes regardless of the prevailing market situation. On closer analysis, the maximization principle—as the rationale of the employer's behavior—appears to be the real source of the disruptive tendencies attributed by Marx to the operation of the economic forces.

With the introduction of marginal utility analysis, the maximization principle assumed new aspects. The relatively simple idea of how to maximize shares in a national dividend was superseded by the idea of maximizing marginal utilities and marginal productivities. The problem of how to maximize utilities expressed in cardinal numbers was replaced by the problem of how to maximize ordinal magnitudes. The problem of how to maximize production was transformed into the problem of how to allocate available resources in such a way that the marginal increment of return from the unit of the resources was equal in all alternative uses.

A central position was assigned to the maximization idea in welfare economics, the problems of which turn on the question of how to maximize economic advantages and minimize costs. In due course these studies were faced with the intricate problem of how to measure and compare individual utilities and disabilities. In more recent discussions considerable doubt has been cast on the applicability of the maximization principle to the analysis of the normal behavior of the businessman.

### *The Notion of Time*

Most puzzling has been the role played by the concept of time in the history of economic reasoning. In accordance with the principles of Aristotelian logics, the Scholastics were requested, in the words of Whitehead, to derive the historical world of change from a changeless world of ultimate reality. Practically all aspects of medieval thinking point to the timelessness of the mental attitude of Scholastic theologians and their contemporaries.

Although Francis Bacon, the great teacher of many mercantilist economists, had recommended observation and experience as the

primary instrument of analysis, the mercantilists were prevented by their predilection for the mechanical approach from including the time element among the factors to be taken into account in establishing relationships between economic phenomena. Leading eighteenth century economists, such as D. Hume and Adam Smith, did not overlook the importance of historical change; but the theoretical concept of economic system which grew out of mercantilist thinking, the economic regularities and laws which were sought after, were dominated by the equilibrium concept and considered applicable regardless of time and place. In the Ricardian economics, all vestiges of the historical approach were eliminated; the "economic man" was the timeless agent of a well-balanced, fictitious economic machinery in which the use of the productive factors was assumed to be perfectly flexible and the relation of prices to changing market conditions was assumed to be almost instantaneous; savings were supposed to be fully invested without delay; the time-involving function of money to serve for storing up values was ignored; and so on. Some leading post-Ricardian economists, such as Jevons and Walras, dreamt of economics as a science of timeless applied mathematics.

Within the context of post-Ricardian economics, A. Marshall gave a limited consideration to the time element. In an often quoted dictum, he pointed to the element of time as the center of the chief difficulty of almost every economic problem. In his study of the short-run and the long-run equilibria of hypothetical-representative-firms, he measured time in terms of intervals dependent upon the modifiability or fixity of the forces operating on the supply side. The term "operational" measures of time was later applied to such varying standards of measuring time.

In this connection F. H. Knight spoke of kinetic methods designed to show how the equilibrium is established over short periods when general conditions are assumed to remain unchanged. Knight reached also into the time problem in his proposal to explain profits as surpluses derived from uncertainties.

The members of the Austrian school, who were not tempted to apply a rigid equilibrium concept in devising their economic system, did not assume timeless reactions of prices or other economic magnitudes to changes in market conditions. As suggested by Böhm-Bawerk, two special aspects of the time problem attracted their attention: the subjective time preference for present as compared with future goods and a sort of operational objective concept of time connected with Böhm-Bawerk's average period of production. Extensive discussions have turned on the relevance of the time factor for the explanation of interest on capital.

Among Knut Wicksell's most promising contributions to Böhm-Bawerk's theories of interest and capitalist production was his reference to expectations as a significant element of economic processes. Such expectations, whether entertained by employers, consumers, or savers of capital assets, are psychological phenomena involving a concept of subjective time. It was realized that for purposes of equilibrium analysis, subjective time was to be translated into operational time and the latter into calendar time—the time underlying the general course of actual economic events. Only calendar time is not measured by changes closely connected with the purposes of measurement.

Wicksell's suggestions were elaborated by his Swedish followers in studies in which methods of sequence analysis were used for examining hypothetical cases of discontinuous change. Special attention was given to the so-called "unit" period—the period of adjustment during which one or more significant variables were assumed not to change.

The process of change was transformed into a series of temporary equilibria by economists such as Hicks who attempted to adjust the Marshallian models to conditions obtaining under the influence of expectations of future prices. The stability of the equilibrium system appeared to be seriously weakened when account was taken of expectations. Considerable discussions have turned on the question of whether stability is likely to be promoted by the greatest possible flexibility of the price system or whether, as suggested by Keynes, rigidity of the wage level is to be counted among the measures fit for promoting stability.

In the course of the development of monetary and business cycle theories, two important ideas connected with the time factor were added to the arsenal of our instruments of analysis: the multiplier—intended to determine the relation between changes in investment and changes in income—and the acceleration principle, according to which every fluctuation in the demand for finished goods leads to far stronger fluctuations in the demand for producers' goods needed for producing the finished goods. When account was taken of these factors, as a rule a discontinuous concept of time has been used.

Still in a more or less preliminary stage is the difficult problem of how to allow for changes in economic relationships assumed to be continuous.

The difficulties which the adherents of hypothetical reasoning experienced in dealing with the time factor were largely ignored by the followers of those nineteenth century philosophies which preserved the belief in the power of reason to grasp the "intrinsic" reality of outside events with the aid of appropriate concepts. Since they considered continuous change an "inherent" element of the "real" course

of events, the logical operations which they performed were alleged directly to reflect such continuous processes.

Such logical operations were characteristic of the methods used by the German historical school. The very name of the school indicates the importance which its adherents attached to the element of time as a factor indispensable for the understanding of any economic phenomena. In sharp opposition to the timeless hypothetical laws of Ricardian economies, they hoped to discover historical laws determining for specific periods and nations the rules or regularities underlying changes in economic relationships. Quite commonly they circumvented the difficulties involved in dealing with the concept of continuous change by the use of biological analogies which included attributes such as continuous growth and decline, expansion of economic forces, structural developments, and the like. The term "organic time" might be used for denoting the time span which covers the growth and decline of an organism. A similar concept was used by those German economists who distinguished "stages" in the history of developmental economic processes. Each stage was believed to be marked by growth and decline of its characteristic features. The scientific results of vague analogies drawn between collectivities and organisms were not very significant.

Again another concept of time—that of "evolutionary" time—was used by the adherents of dialectic reasoning, especially by K. Marx. For dialectic reasoning of the materialistic type, continuity of time was of outstanding importance, since that reasoning was intended to convey the idea of incessant changes occurring in reality in the structure of production, and in economic and social relationships, up to the point at which a revolutionary climax is reached in the clash between antagonistic forces. The continuous growth of an antagonism inherent in the capitalist order was alleged to be reflected in its full reality in the contradictions of a logical process. In his schemes of simple and expanding production, however, Marx appears to have resorted to the use of a concept of discontinuous time. These problematic schemes were further elaborated by some adherents of his doctrine.

Where the concept of time entered into economic reasoning, the meanings attached to the concept showed considerable differences. The more or less indifferent concepts of calendar time and continuous and discontinuous time have been associated with all methods of reasoning. Within the framework of hypothetical reasoning, the concept of discontinuous time has been used in connection with the methods of comparative statics and sequence analysis. Also of the hypothetical type have been the concepts of subjective time and of operational time. The concept of organic time has been widely used by members

of the German historical school; the concept of evolutionary time has been indispensable for dialectic reasoning.

### *The Concept of Freedom*

A discussion of the concept of freedom as a meta-economic category can conveniently take its start from a definition of freedom as the faculty or the right to choose among various alternatives. A concept of this type was implied in the Scholastic notion of "freedom of the will" which was the counterpart of the power of reason to teach with finality what is right or wrong, what is true or false. The "terrible" Scholastic power of reason limited the choice of the will to very narrow ranges of behavior, since there was nothing adiaphorous in the medieval world and everybody was assigned a fixed place in a strictly hierarchical organization. The fight for individual liberties began with the fight for the freedom to formulate new concepts and new teachings which were independent of the decisions of clerical authorities. In the course of that struggle a logical foundation for individual liberties and social institutions such as private property was sought after in innate ideas or natural rights. Later, when the belief in innate ideas and natural rights was eliminated, reason was assigned the subordinate functions to show the most adequate means of achieving objectives chosen by the will and to explore and evaluate the chances of reaching constantly shifting ends. Randomness of wants, as that principle has been termed, became a cornerstone of the utilitarian philosophy. Along with the increasing use made of the methods of hypothetical reasoning, liberty of thought, tolerance, and democratic procedures became closely associated ingredients of social organization.

That spiritual development provided the background for unfolding mercantilist thinking. The request for economic freedom which the Physiocrats derived from a natural individual right was based by the advanced mercantilists on the belief that the functioning of a mechanical system governed by causal interrelationships would be disturbed rather than helped by measures of government interference. That idea of transforming the principles of free competition into an ingredient of a causally determined order was forcefully presented by Adam Smith and used by Ricardo as the starting point of a logically consistent doctrine.

The hypothetical aspects of that approach were even more consistently developed in the doctrines of the marginal utility type in which any normative connotations were eliminated from the concept of free competition. It was assumed that the freedom of each individual to balance his marginal utilities and disutilities was limited only by a



similar freedom of all competitors; that assumption was conceived as the logical basis for assuring the most rational or economic use of a limited supply of productive resources confronted with a much larger demand. The hypothetical features of the concept of free competition were given new emphasis in the recent studies dealing with the limited role played by perfect competition in actual economic organization.

The importance of individual freedom and free competition for the organization of society was belittled or even ridiculed by almost all schools of thought which rejected the methods of hypothetical reasoning. Most adherents of the German historical school who identified public interest with national power politics favored the establishment of public as well as private monopolies as instruments of such politics. They applied the Darwinian principle of the survival of the fittest to an alleged struggle waged between conflicting nations. The idea of individual freedom was lost where such reasoning was firmly established.

Under the rule of dialectic reasoning, adopted by K. Marx, all hypothetical features of Ricardian economics were transformed into antagonistic forces operating in reality; these forces were said to find their expression in the self-development of the modes of production and distribution and in the evolutionary class struggle. The workers were shown to be engaged in a heroic struggle, not for individual liberty, but for the liberation of their class and the annihilation of the employers. The liberty promised after the establishment of the communist so-called "stateless" society was an ill-defined metaphysical concept.

Hence within the context of deterministic doctrines the concept of free competition has been either eliminated as far as possible or transformed into a fateful struggle for existence. Individualistic doctrines have originally included freedom of competition among the precepts taught by natural law. Later, freedom was conceived as a rational principle of an economy functioning in accordance with the laws of economic causality. Finally, it was used in a purely hypothetical form for the construction of imaginary mechanical economic systems.

### *The Concept of Law*

The fight which was waged over the liberation of the methods of thought from the fetters of medieval reasoning was clearly reflected in the gradual development of the concept of causal law as applied to social relationships. All notions of the scholastic sociology or economics included normative elements; all "laws" which corresponded to these notions were precepts, formulated as eternally valid, absolutely binding commands. Subsequently the development of the doctrine of natural laws was indicative of the strong desire to find in an innate faculty of reason a justification for the vindication of certain individual rights.

The ensuing application of mechanistic conceptions to the relationships between economic magnitudes suggested the search for laws of nature or causal laws of an economic or sociological type, but until late into the eighteenth century the borderline between normative and causal laws remained blurred and ill defined.

The first thinker who quite clearly used the term "law" in the causal sense for defining rules underlying relationships between economic phenomena appears to have been Ricardo. The catalogue of the fundamental laws of Ricardian economics, based on the distinction between hypothetical and empirical laws, was established by Senior and elaborated by J. S. Mill. Whereas empirical laws, derived from observation and experience, were considered falsifiable, hypothetical laws, derived from assumptions, served the purpose of constructing imaginary models of economic relationships which were frequently far removed from the results of actual observation. Such constructions were considerably encouraged by the application of marginal utility and marginal productivity analysis. The same was true of the search for causal or functional relationships between economic magnitudes.

Simultaneously the maxim that reason was unable to establish generally valid normative rules of behavior led to the consequence that formulation of principles of economic policy was beyond the scope of scientific economics. When the principles of hypothetical reasoning were strictly applied, it was even questionable whether it was possible to establish economic laws of the causal type. The relationships between economic phenomena were regarded as purely functional for purposes of theoretical economic analysis.

The concept of hypothetical laws was incompatible with the logical principles of economic or sociological schools which believed in the power of reason to discover the substance of things and to teach the real laws underlying the course of actual events. But never fulfilled were the ambitious hopes of the members of the historical school to arrive at a full understanding of the development of the various national collectivities and economies through the discovery of "historical" laws, reflecting the individuality of these collectivities.

Again radically different from hypothetical laws and the historical laws are the "evolutionary" laws advanced within the context of the dialectic method of reasoning. Absolute validity has been claimed for these laws because of the reputedly infallible methods used in establishing them. Examples of laws of that type are the law of the class struggle, the laws of capital accumulation, the law of the falling rate of profit, and the like.

Among all the meta-economic concepts the concept of law has probably been the object of the most divergent meanings. It has been used

for denoting moral or legal precepts derived from revelation, from an innate faculty of reason, or from the will of authorities, however constituted; for denoting the existence of regular causal relationships suggesting identity in time or of purely hypothetical relationships assumed to follow from exactly defined assumptions in accordance with rules of hypothetical reasoning; for denoting the results of empirically determined regularities frequently found with the aid of statistical methods; for denoting certain regular relationships discovered through intuitive penetration into the meaning of the course of predominantly historical events; finally for denoting the rules underlying the course of teleologically determined social processes and discovered with the aid of dialectic methods alleged to reflect exactly the rules of evolutionary processes occurring in reality.

### *Conclusions*

If the preceding distinction of patterns of thought is fairly correct, it would be futile to suggest compromises between schools which fundamentally differ as to the methods of setting and solving economic problems. If effected, such compromises might result in beclouding deep-seated differences in the approach to fundamental aspects of economic life and in preventing the clarification of important issues.

It is obvious that in some important respects the foregoing discussion reaches beyond the narrower limits of economics. The principles suggested for the grouping of the economic doctrines could easily be adjusted to the task of classifying the doctrines in practically all other social sciences.

## THE DEVELOPMENT OF THE CONCEPTS OF MECHANISM AND MODEL IN PHYSICAL SCIENCE AND ECONOMIC THOUGHT

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In the past two or three decades, pure economic theory has been mathematized to the extent that even the economist who knows his algebra and calculus is all but helpless when faced with the most recent advances. A determined effort is being made to construct economic theory as a rigorous, quantitatively predictive science. Although this effort is confined to a very small sector of what commonly goes under the title of economics, it happens to affect the heart of the theory. It is obviously not possible to foresee the future course of development in a field teeming with new ideas and approaches. But it is possible to spell out some of the implications of these ideas. Economic thought is rooted in the social order, and it has its effects upon the social order. What effects depends on what kind of thought and what kind of social order it is. Since the new thought tries to produce economic models analogous to physical world models, since its concept of predictiveness is that of the modern sciences of nature, it will be well to start out with an examination of the concepts of model and mechanism in both areas.

### I

What is a model? We may say that it is a small machine representing a large machine. The catch lies in the word "representing." A small-scale but otherwise exact replica of the big mechanism is a model, but one that will interest only the hobbyist, the child, or the museum director. When a scientist builds a model he does not want to reproduce the whole mechanism. He wants to construct something that will do what the large mechanism does; and not all of it either, but only that which is of interest to him. It matters little how and why the model does it. The "Monic" represents the flow of dollars by a flow of colored water. Colored water has nothing in common with dollars except that both are homogeneous, measurable quantities. That is enough for an analogue.

A thought model or theoretical model is a different thing. It is also a representation of an observable piece of reality, but the representation

is made in the realm of thinking, not of reality itself. It took a very long time for the implications of this simple fact to be worked out.

Among the earliest physical world models are those of the Greek atomistic philosophers of nature who laid the foundation for the world view of modern science. To them the world of qualities as we experience it was not the ultimate, not the real world. There was no way of understanding it except by forming incomparable and often incompatible categories with which the mind cannot do very much. Therefore they conceived of an invisible "true" world behind the visible world—an intelligible, quantitative world of material particles whose mechanical arrangements and motions produce all the colorful and variegated phenomena we experience. Their world model was thus mechanistic, quantitative, non-normative, and non-teleological. It could not be mathematized, and its only link with the experienced world was through speculation about the ways in which the assumed real particles might produce the phenomena we observe.

In the sixteenth and seventeenth centuries another type of world model arises. The world model becomes visible, at least on principle. René Descartes explains his world model by the analogue of a large, closed barrel completely filled with small marbles. In the real universe the particles, originally set in motion by God, are moving as marbles would if they were infinitely small and divisible and if the barrel were astronomically large but still finite. Descartes did not try to mathematize this model, and he could not have done so had he tried. For there are no functional laws to be derived from it. But he did lay the ground for 250 years of modelmaking when he geometrized space as we intuitively experience it—as three-dimensional space outside time.

With Newton, physical models enter the realm of full mathematization and full predictiveness. His *Principia* of 1687 contains the greatest and most influential of all physical models: that of classical mechanics. Mechanistic economics, which arose almost a century later, is built in its image, as Professor Lowe has recently demonstrated. Classical mechanics considers a system of material points upon which directional forces operate at a distance according to calculable laws of motion. The choice of paths is governed by the principle of least action, which may be termed the economic principle if we take the term in its widest sense as denoting a maximum-minimum principle. Thus classical mechanics is an economic model, though it is not a model of the economy.

The laws of motion are true modern laws, establishing determinate functional relationships between measurable variables. As a model of the universe, classical physics is calculable in the sense that it renders it possible to find the world parameters by observation. The space of



this universe is the timeless, three-dimensional space of Descartes. The mechanical processes in it are reversible.

It was thought for a long time that all physical models must be mechanical and that physical laws are "real" in some intuitive sense. But the process of physical inquiry led to a surprising fact. Physical laws and properties could be discovered not only by generalizing and formalizing quantitative observations. They could also be discovered by studying the mathematical structure of physical theory. If this examination revealed new unexpected mathematical properties, then it turned out to be safe to give them physical meaning. If verification failed, it was not because the physical interpretation of derived mathematical properties was illicit but because the original propositions were invalid. In other words, the convictions grew that mathematical and natural structures are isomorphic. The belief in this isomorphism is basic to modern physics.

This belief places physical models in a new light. Nature (defined as that reality which reaches us through our sense experiences) cannot be directly grasped. We can only rely on the isomorphism between two incommensurable realms: that of nature and that of thought. How do these two realms interconnect, or, stated differently, how are theoretical models geared to reality? The only link consists in the process of verifying theoretical prediction from the model by observation. This is necessary and sufficient. No complete part-by-part correspondence between model and reality is required or, strictly speaking, possible.

It is evident that thought models based on this conception can attain very great freedom from categories intuitively suggested by our sense experience. At the highest level, the mind builds autonomous mathematical structures called models, derives from them predictive statements about experience, and subjects these to the judgment of the senses through observation.

The models of modern field theory are no longer intuitively linked to reality. They transcend the limitations of mechanical explanation. In these pure thought constructs, timeless Euclidian space is replaced by a unified time-space concept deriving from a mathematics capable of dealing with "space" of any desired dimensions.

## II

Classical economics made the tremendous discovery that the quantifiable features of a modern economy can be represented by a general mechanistic model capable of mathematization and presumably prediction. The emerging capitalistic system made economic processes increasingly rational and calculable while at the same time granting them a social ascendancy they had never before enjoyed. It swiftly

transformed the old well-articulated society into something which, for a while at least, looked like a vast and rapidly increasing aggregate of more or less homogeneous human beings moving and acting under the impact of economic motivations imperiously overriding all others. It is not surprising that the quantifiable features of this new economy were thought to be all that mattered to economic theory. Everything else could be disposed of as random disturbances, trial and error, and friction—all thoroughly mechanical concepts. But the fact that the economy is imbedded in a social order unfolding in history asserted itself from the very beginnings of the science by repeated revolts against mechanistic theory. These nonmechanistic revolts so far failed to deal effectively with the quantitative features of the economy, nor have they produced satisfactory tools for analyzing the historical changes of social structures and the problems of social power which are just as much part of economic life as are the laws of the market.

The earliest mechanisms of economic theory need not detain us. It is with Adam Smith that the quantitative science of economics springs to life. His model is fundamentally a general mechanical equilibrium model—a complex servomechanism—but as yet incapable of mathematization. The model asserts that if the particles are left undisturbed in their movement along cost minimization paths, then the system as a whole will automatically attain equilibrium at maximal production and optimal distribution. This was at once a statement of theory and the expression of a guiding social myth.

Cournot provided one feature needed for the mathematization of the model when he introduced the schedule concept, together with the proper formalism of analytical geometry and calculus as the tools for analyzing time-reversible motion in Cartesian space along supposedly continuous curves and surfaces. This is still the dominant language of microeconomics.

The Lausanne school rose to the subsequent task of formalizing the general equilibrium system. Again a new formalism enters: the algebra of simultaneous linear equations. The solution was at once a triumph and a catastrophe. The proof that a sufficient number of equations is available to solve for all unknowns was mathematically decisive but in practice self-defeating.

R. G. B. Allen's *Mathematical Analysis for Economists*, published as late as 1938, illustrates the terminal stage of the classical approach. The word matrix is not mentioned in the book, and its chapter on determinants lists no economic applications. Yet the new theoretical movement had already been on its way for well over a decade when Allen's book was published.

This movement was not a sudden revolution. It started out harm-

lessly enough, trying to make classical theory rigorous and predictive. Yet its novelty becomes very clear when we compare the old distinction between "descriptive" and "theoretical" economics with the new concept of "econometrics" in which theory and observation are integrated on the theoretical plane itself. The new theory is driving towards full mathematization, not because of the advantages of mathematical over literary presentation, but because mathematization is the proper form of a purely quantitative theory. It is driving towards predictiveness, not because of the supposed usefulness of economic prediction, but because a non-predictive quantitative science is non-verifiable. It is driving towards rigor and abstractness, not because it wants to escape logical and historical fallacies, but because rigor and abstractness are the essence of mathematical structures and the source of their explanatory power. In short, the new theory is what it is because it understands the true nature of a quantitative science and accepts what inevitably follows.

It is from this point of view that we shall take a brief look at three outstanding types among the new economic models.

The first of these types is perhaps the best known and most easily accessible one: the dynamic macroeconomic model designed to explain and predict business cycles. This type of model introduces time and change into the timeless equilibrium system. It is strictly mechanistic, using such mechanical devices as shocks, lags, multipliers, accelerators, ceilings, etc. The structural parameters are derived from observation. The time of these models is still the reversible time of classical mechanics. Structural changes and growth factors are as yet treated as exogenous and reversible.

Another type of model is being developed by the new "theory of programming" or "allocation." The most easily accessible model of this type is the Leontief input-output model—a reconstruction of the equilibrium model designed to make it predictive and potentially dynamic. But the Leontief model is a wayside stop on the road from classical equilibrium mechanics to the new "normative" economics of allocation theory. This theory is of great generality, having already been applied to such diverse problems as the routing of wartime shipping, organizing the Berlin air lift, solving management problems, investigating theorems of welfare economics, and planning interindustry changes.

Here the distinction between "technical" and "economic" problems obviously no longer applies. In general allocation theory, economics is only a special case, just as economic systems are special cases of allocation systems. This represents one innovation. Another follows from the first. The concepts of price and market, consumers'

preferences, etc., are no longer basic. They can be derived and defined in terms of the general allocation scheme. Hence theory is freed from the limitations of institutional setting. It can consider on equal terms the management of a firm, the workings of a market economy, and the decision-making of a central planning authority. Thirdly, it can be normative. Unlike classical theory, it is not confined to the question what the terminal state of the economic system will be, given its initial state and its laws of operation; normative economics can simultaneously consider the initial and the terminal state and select the minimum path from one to the other. The theory of allocations has the makings of a rigorous, predictive, general theory of planning.

Unlike the others, a third type of innovation—the theory of games—does not grow out of classical economics but goes down to foundations to build a new model of rational social behavior. Two brief remarks about it must suffice. First, the games model promises to explain power phenomena as the predictable consequences of rational social behavior. This would be a tremendous gain in realism over traditional theory, which treats power as irrational and exogenous if it treats it at all. Secondly, the model, if successful, would close the disturbing gap between micro- and macroeconomics, rigorously and without a formal break moving from one to the other.

We may summarize. Dynamic models try to predict macroeconomic developments by way of change mechanisms, econometrically linked to observation. Allocation theory reformulates the mechanical equilibrium model in a radically new way, leading towards a theory of planning. The theory of games replaces the classical mechanistic model by starting from the ground with a new model of rational social behavior itself.

### III

To many economists, the new ventures must seem like an intellectual space opera: overzealous in their mathematicism, naïve in their simplification, and beautifully unrealistic in their flight towards unattainable predictive goals. But then, what is so realistic about the old science? How realistic can it be, considering that the economic reality it tries to explain is a graven image of its own making? As a rule, the economist studied economic theory before he began his regular, systematic observation of economic life. His picture of reality grows in him as uncounted casual and systematic observations are fused into a coherent whole under the organizing influence of his theoretical beliefs. Among these beliefs are some that represent a mythical survival of features of the Smithian model which have long since been abandoned. Theory therefore enters the economic

image in its formative stage; hence, "verification" of theory by reference to the "generally accepted" image of reality is circular. Moreover, there is no guarantee that features of reality foreign to the prevailing model and myth will force themselves into their rightful place in this image.

Because of this hidden circularity and also because the economist tends to know the history of economic thought better than he knows the thinking of those who make economic history by operating a business, a curious attitude has developed towards patent discrepancies between observation and theory. In physics it is theory that becomes suspect when such discrepancies arise; in economics it is reality. A few excerpts from a round table discussion on *The Impact of the Union* (edited by David McCord Wright; Harcourt, Brace and Company, 1951) may illustrate this attitude. We quote (pages 117, 118-119, and 122; italics added):

BOULDING: *Why did we ever have a market?* It's rather baffling, because all the forces are arrayed against it. Everybody's individual interest is to be a monopolist.

KNIGHT: Always has been.

BOULDING: *The only thing wrong with capitalism is that nobody loves it . . . this is something you have to take into the picture if this is going to be social science and not just economics.* I mean all this ignorance. Why are people ignorant? Well, because as you say, we haven't succeeded in *putting truth into a myth.*

KNIGHT: I want to say one thing. Man is romantic. People hate trade. They hate profit . . . they hate truth. . . . *You can't get that out of the picture and talk about reality.*

CHAMBERLIN: Don't you think that another thing they hate is measuring things? *Part of their revolt against the market is due to the reduction of everything to quantitative measure. . . .*

KNIGHT: Some great author said the ability to do algebra is a form of low cunning. I have a great deal of sympathy with that. [Laughter.]

Now this is obviously not to be taken any too literally:

CHAMBERLIN: [What] is there ignorant about a monopolist . . . who thinks that by pursuing a monopolistic policy he can improve his own position?

FRIEDMAN: Nothing. He is absolutely right.

And out goes the "invisible hand." But the "myth" of the "invisible hand" stays to haunt the economist.

For one thing, he observes that the world is not as it ought to be, and since he has no proper tools in his kit to grip this eel-like fact, he is forced to call knowledge ignorance and to wonder why all these romantic people ever created the market.

What worries him still more is that he has failed to put what he continues to call "truth" into a "myth." He recognizes by now that the historical process that cast the economy into the mold of communicating markets has not cast the minds of men into the corresponding mold of underlying beliefs. But he still refuses to recognize that, faced with this fact, his concept of control is unrealistic and theoretically



untenable. This concept of control consists in making it the theorist's task to tell the man who is about to jump from the bridge that he will drown if he does, and to leave it at that. If the man has common sense, he will stay on the bridge. If not, well, it's *his* funeral, isn't it? Control then consists of prediction offered as purely technical, neutral, powerless advice. The sons of Adam Smith fear control of man over man. And rightly so, for such control implies the dehumanization of the human realm. The ethos of classical economics revolts against this consequence. But its epistemology works towards it. So long as the theory is unpredictable, the conflict can remain unresolved and even undetected. But should the theory become predictive, it may yet turn against its origins and become instrumental in subverting economic freedom.

Moreover, the world this theory seeks to explain is no longer the world of Adam Smith. In the world of contemporary business the accent has shifted from the automatic workings of the market mechanism to technical control of predictable processes. The new approach to economics reflects this change of accent. Its concepts of prediction are those of a rigorous, fully mathematized science of nature. But the processes to which this concept is applied are social processes. That makes a difference.

#### IV

It has been argued that predictiveness is beyond the grasp of the new theory. But the arguments appear unconvincing. The practical obstacles have been called insuperable. They may be, but it is too early to say, what with so many analytical and computational power tools newly available. Again it is claimed that no model can possibly embody all the factors that do or may affect the phenomena studied. But the introduction of the strategically important factors alone would go a long way. Will structural changes make models obsolete as fast as they are constructed? If these changes are quantifiable, they can be built into a model. And if they are not quantifiable? Well, no pure economic theory proposes to predict them anyhow. How close to success are the modelmakers? That is a serious question, but not a fundamental one.

It is more profitable to think about the kind of prediction and control implied in the new ventures. Dynamic business cycle models may come to predict the quantitative effects of changes in the variables. This would make macroeconomic control through the control of strategic variables feasible. But if such models were to become predictive, their predictions would also have direct effects upon the economy. For men, unlike stars or particles, understand predictions

and act upon them. To the extent that prediction alters the course of the predicted event, the publicizing of reliable predictions is therefore itself an act of control.

The theory of games, should it succeed, would provide a calculus of strategies for top-level policy making in large organizations. By making the behavior of "coalitions" understandable, it may also make it controllable.

Allocation theory has already been applied to organizing flow towards predetermined goals. But it also can attack the question what goals should be set. First, it can ask whether desired goals are attainable with given means. Secondly, it may measure different goals by some normative standard, and select the best one. Thirdly, it may give rise to the construction of goals different from, but equivalent to, those toward which the economy is freely moving. For example, it need not take consumers' preferences for granted. It may ask what other combination of preferences will produce equal satisfaction while being preferable on other grounds. This subjects the goals themselves to analysis and control. In fact, consumers' preferences are already under industry control in important fields. It is neither impossible nor fantastic to visualize that such control should be co-ordinated and centrally planned. Again, by considering prices, markets, etc., as structural factors of the system rather than as the results of the operation of economic laws, allocation theory brings a radically different kind of control into focus—control operating through structural changes in the economy rather than through legal restraints or manipulation of the market factors.

## V

Is it legitimate to speculate so far ahead, having no more to go by than tentative theoretical beginnings of as yet small practical value? It is, unless we consider the making of theory and theoretical models a wholly arbitrary process. The theory maker must from the outset adopt a structural plan for his theory. To make the theory rigorous he must follow this plan as he goes on. To make it predictive he must constantly relate the model to observation. Once economic theory is conceived of as a mechanistic science dealing with quantitative phenomena, rigor and predictiveness must be accepted as its final form. Should all the present models fail, new models and new approaches would have to be tried until one of them succeeds or until it is discovered that none of them will, and why. Again, if predictiveness is achieved, then control must follow to the extent that economic phenomena are subject to planned human action.

To hope that men will for the sake of their freedom leave new

means of control unused does not seem realistic. They will use the means of control and redefine freedom. They are doing it already.

They are also redefining control. They have to. They use control every day and are proud of it. When they look at their economic environment, they find the scene dominated by vast economic and political combines smoothly operating by a thoroughly rational system of internal controls. This is why programming theory is more realistic than the traditional theory of the firm and why the theory of games, if it can explain the behavior of "coalitions," will be more realistic than the traditional theory of market behavior. Control can no longer be identified with interference and with disturbing the natural harmony of the economy. The new models reflect the economy of our day as surely as Adam Smith's model reflected that of his time. But, of course, they may not succeed any better than his did.

At any rate, what happens in the present development of economic thought is worth watching. Economics is the pioneer among the social sciences; it is first in carrying the rigor and power of natural science into the social field with some initial theoretical success. This is not only a bold undertaking; it is also an inevitable and, above all, a grave undertaking. To obtain a just view of its implications it would be good to know what a rigorous, predictive theory of social processes can do, what it cannot do, and what it will do to society if it does what it can.

## DISCUSSION

JOSEPH J. SPENGLER: Dr. Pribram's main thesis is twofold: that the constellation and the sequence of economic events do not significantly influence the pattern of economic reasoning; and that the development of economic reasoning in the Western World has been shaped predominantly by the manner in which thought and philosophy in general have developed in this region. That the second part of this thesis possesses considerable validity, most students of the history of economic thought would agree. In the form set forth by Dr. Pribram, however, his total thesis seems to me to be subject to a number of limitations—limitations which probably Dr. Pribram would admit. It is upon some of these limitations that I propose to touch.

Each major pattern of economic reasoning, to employ Dr. Pribram's term, is in effect a system or body of theory. It consists, or eventually should consist, of a number of explicit propositions which are more or less interdependent and which, by themselves or in conjunction with a number of hidden propositions and implicit assumptions, constitute an ordered system of thought. It is the function of such a body of propositions to explain some portion of underlying reality—a portion which comprises, in the present instance, economic objects and events, and possibly also the value orientations that underlie man's economic behavior and affect his analytical reactions to it.

A system of thought is subject to change from a variety of sources, among them the following: changes in the constellation and sequence of events; changes in the extent to which man believes his propositions to represent referent reality; changes in man's *Weltanschauung* and in the values he sets store by; changes in man's intellectual and scientific climate; and changes arising out of the tendency, stressed by T. Parsons, of bodies of theory to develop in certain ways in consequence of their internal constitution. It is the fourth of these sources that Dr. Pribram emphasizes. To the others, not all of which I shall discuss, he appears to attach relatively little importance. Nor does he account, in actual or hypothetical terms, for the supersession of one body of theory by another, be the underlying cause the former's lack of predictive power, its unnecessarily great complexity, its comparative nonconsonance with reality, or some other defect.

Bodies of theory are affected in several ways by the objects and events composing reality. First, when particular propositions fail to conform sufficiently with the reality to which they relate and this divergence comes to be observed, the propositions tend to be modified. Such modification usually entails appreciable modification of the body of theory itself, because propositions that are closely connected with the ones initially modified must undergo compensatory modification and because some assumptions which hitherto have been implicit may now have to be given an explicit form. Second, when the constellation or the sequence of economic events undergoes change, new problems to which men must find solutions tend to be precipitated. Search for

these solutions involves application of the body of theory in vogue. Such application in turn serves to reveal inadequacies in the existing body of theory; and these inadequacies, as they become manifest, prompt men to take rectifying action. Third, as Mannheim observed, great disruptions of the pattern of events, as by war and revolution, may modify the *Weltanschauung* of the intelligentsia.

Changes in the constellation and sequence of events, economic and otherwise, may facilitate changes in the intellectual climate which in turn produce modifications in the body of economic theory. For example, E. Zilsel supposes that the mechanist conception of nature, developed in and after the seventeenth century to generalize the view that all events are subject to so-called "natural laws," reflected man's experience with the kinds of mechanical equipment then in use; and that the replacement of mechanical by nonmechanical conceptions of nature in the late nineteenth century, while made possible by Hume's theory of causality, was greatly facilitated by the ascendancy of nonmechanical processes in industry.<sup>1</sup> The resulting nonmechanical and functional conception of causality has passed over into economics.

Of importance for the development of economic thought are the value orientations in effect, together with the changes that take place in these value orientations. Such orientations affect both the goals men strive after and the manner in which these goals are pursued. The composition of economic theory may change, therefore, when these value orientations change. For as man's goals change, the instruments employed to realize them change, with the result that new demands are made upon that part of the pattern of economic reasoning which relates to the instrumental arrangements employed by men to achieve economic purposes. The values to which man subscribes also limit the effectiveness of his hypotheses when man's adherence to these values is incompatible with his making the hypotheses fully objective.

Dr. Pribram identifies three systems of economic reasoning: the organic, the dialectic, and the mechanic. But, supposing it to be his intention, he does not demonstrate how it came about, if it be true that economic reasoning has been shaped primarily by the intellectual processes controlling Western thinking, that the organic, dialectic, and mechanic systems persisted side by side in the nineteenth century despite their unequal adaptability to the tasks of economic analysis. Likewise, Dr. Pribram discusses five so-called "meta-economic" concepts—equilibrium, maximization, time, freedom, and law—but he fails, if it be his intent, to show how the evolution of these concepts has been conditioned by the evolution of Western thinking in general. On the basis of his showing, therefore, I am not persuaded that he has demonstrated his thesis.

His thesis concerning the determinative influence upon economic reasoning of the development of Western thought might be tested in a number of ways. Abstracting from the fact that economic science was never shot through with animism, did the conception of the economy as something organic—a conception supposedly held to by some medieval philosophers and some nineteenth century economists—change in consequence of changes in epistemology, in

<sup>1</sup> *The Development of Rationalism and Empiricism* (Chicago, 1941), pp. 60-64, 70-71, 90-94.



the concept of entelechy, or in prevailing ideology? Did the application of the dialectical method to the analysis of economic subject matter in any significant way reflect changes in Western thought? Again one might inquire into the response of economic analysis to the rise of the theory of evolution or to the development and application of modern logic. Yet again, one might inquire into the response of the conception of the economic universe to the development of mathematical and statistical theory and practice.

Dr. Pribram's approach tends to play down the developmental character of economic science. For one thing, causes or laws are seldom uncovered in empirical sciences until after phenomena have been classified. For another, the verbal and conceptual apparatus of a science must become increasingly precise and suited to empirical research. The latter development has been touched upon by Professor Sebbä. The former development, while not wholly uncharacteristic of economics, has been obscured by the fact that so many inferences have been drawn by economists from man's probable behavior tendencies in given situations. This shortcoming, if it be such, is being corrected through the utilization of other behavioral sciences jointly with traditional economics.

CARL F. CHRIST: Can the physicist's mechanistic view of reality be applied fruitfully to economics? This is the central question of Professor Sebbä's engaging paper, on which I have been asked to comment because my way into economics was marked by a brief sojourn in physics.

There are many points upon which I would like to comment: in many to agree, in a few to disagree, in some to press for clarification, and in some to shift the center of importance. Since a coherent story is intrinsically more interesting than a catalogue of specific points—and also shorter in this case—I think it will be preferable to make a fresh approach and let the specific points appear as I go along.

The concept of model has become more common in economics as the use of mathematics has increased. Most people (including Sebbä) use it loosely to mean a theory or a body of theoretical statements, often mathematical (consider the Bohr model of the atom or the Keynesian model of the economy) and everyone understands it. For our purposes, no more elaborate definition of "model" is required.

The concept of mechanism has been used in many ways in many disciplines. In discussing its development in physics and economics, we should find out how the physicists define it, for they had it first. Professor Henry Margenau, of Yale, put it this way: "The mechanistic view in a wider sense is held by everyone who believes himself to be an observer in an *independent* universe [*italics mine*] and who locates all events and objects uniquely in time and space."<sup>1</sup> To this I think should be added, as the context of the quotation confirms, the belief in the orderliness and regularity of the world. I shall adopt this definition for my remarks here. Mechanism is not the same as mathematics in a discipline, as the example of physiology will show, although mathematics often accompanies or follows close on the heels of mechanism.

<sup>1</sup> Henry Margenau, *The Nature of Physical Reality* (McGraw-Hill, 1950), pp. 38-39.

On its early side, the mechanistic view is to be distinguished from the naïve deistic view according to which every event is the result of a specific divine act, the personification view according to which all phenomena have consciousnesses and wills that can be appealed to by appropriate gestures or actions, the organic view discussed by Professor Pribram, and so on. On its later side, it is to be distinguished from the current view taken by modern physics, according to which the universe cannot by nature be independent of the observer.

The reason for the inception of the mechanistic view is amenable only to surmise, but the reason for its persistence and growth to a position of great influence is clear. It led to spectacularly successful attempts to rationalize observed regularities among phenomena in astronomy, biology, chemistry, mechanics, optics, thermodynamics, electrodynamics, and even relativistic physics (which is already regarded as a part of classical physics!). The success of the theories so evolved lies not only in the fact that they are consistent with observed phenomena; for after all an infinity of theories could be successful on this ground, including the theory that everything is the way it is because God made it so. Their real success lies in this fact: they lead one to form expectations about events not yet observed, such that if the expectations are not fulfilled the theory must be judged wrong, and then it turns out time after time that the expectations *are* fulfilled. Such theories can be used to make predictions, and thereby men can control their environment and achieve many of the goals they pursue (often with some unforeseen consequences, however). These very theories have been a *sine qua non* of the profound changes that are the subject of economic history.

The mechanistic view has thus become an integral part of the intellectual outlook of the modern Westerner. The real controversies that still prevail over it, outside of physics, do not concern its validity in the natural sciences but rather concern the limits of its applicability to humans by humans.

Why then has mechanism declined in modern physics, in favor of a view that regards the observer and observed symmetrically, each affecting the other, and that no longer locates each event and object uniquely in time and space? It is because, in the study of small particles and electromagnetic energy waves, the mechanistic view no longer led to successful rationalizations of phenomena but led instead to nonsense or even to contradictions. For example, it has been found that by techniques of measurement relying on light or other electromagnetic radiation signals (and no others are known), it is inherently impossible to observe exactly both the position and velocity of a particle, even assuming no experimental error. This is known as the Heisenberg principle of uncertainty. The length of the range within which a particle is observed to be is called the uncertainty in its position, and the length of the range within which its velocity is observed to lie is called the uncertainty in its velocity. Heisenberg found that the product of these two uncertainties cannot be made smaller than a quantity related in a simple way to the mass of the particle and the famous Planck quantum constant. Thus if position is measured more accurately, the uncertainty in the velocity measurement grows, and vice versa. This conclusion becomes more credible when it is

remembered that in order to observe a particle one must bounce a light ray (or *some* electromagnetic ray) from it. Since all such rays carry energy and transfer some of it on impact, a particle's velocity will be changed by the very act of observing its position. Two observations of position are necessary to determine velocity, and hence the uncertainty about the velocity of a particle before (or indeed after) observation. The principle is important only in dealing with small atomic particles, for the impact of observation on comparatively massive particles such as planets or even ping pong balls is so slight that the uncertainty there is completely submerged in experimental error.

So much for the remarkable fruitfulness of the mechanistic view in problems of classical physics and its demise in the modern sphere of quantum physics. Let us turn to its place in economics. Here I have three points. The first has to do with the rise of the mechanistic view, the second with the place of mathematics, and the third with the limits of usefulness of the mechanistic view in economics. I shall take them up in order.

First, the mechanistic view got its start in economics partly because of the historical factors given by Sebbä and partly because its great success in the natural sciences made it very attractive to workers in the younger field of economics. Its appeal is particularly strong in the positive sphere of economics, which makes statements about what is, as opposed to the normative sphere, which makes statements about what ought to be. This is understandable, for in the positive sphere it is convenient to regard the economic system as a sort of mechanism which behaves according to predictable laws.

Apropos the distinction between positive and normative, a short digression is in order to correct an impression Sebbä gave by saying that in the new theory of programming the distinction between technological and economic considerations no longer applies, and that programming theories are capable of supporting normative statements. Actually, programming theories are a part of positive economics just as the usual production theory is. They admit of the same distinctions between engineering or technological considerations on the one hand, which specify the possible relationships between inputs and outputs, and economic considerations on the other hand, which specify the combinations of inputs and outputs that will be chosen by a profit-maximizing individual under given prices or other conditions. Their chief innovations are twofold. They look upon the production possibility surface as being defined by a number of discrete points, each corresponding to some particular production process, rather than as a smooth surface. And they make explicit provision for the winnowing procedure (taken for granted in the usual production function) whereby efficient combinations of inputs and outputs are selected from all technologically possible combinations. Like any other physical production theory, they can support normative statements only when value judgments of some kind are included as premises.

The success of the mechanistic view in economics has been much less spectacular than in the natural sciences. There are many reasons for this, which have been thoroughly discussed by many writers. An important one is the fact that empirical regularities in economics are much more difficult to observe, and much fuzzier when they are observed, than are those in the natural

sciences. I venture that if economists were able to observe empirical correlations of the order of .99 between many pairs of economic variables, economics would soon contain many more theoretical statements that have been confirmed by empirical evidence than it does now, and economists would be much better at making predictions than they are now. However, most economic problems involve a large number of variables of which none or few are under the control of the economist, and the data which the economist has to work with are not typically reliable to very many significant figures; so that it is difficult to tell whether a given theoretical statement is in agreement or in conflict with a relevant empirical observation.

Second, the use of mathematics as a tool in economics is almost as natural as in the physical sciences, because of the numerical character of many economic data and the functional relationships among economic variables. But in economics the power and virtuosity of mathematics are turned chiefly on theoretical areas where the empirical influence is too seldom felt; mathematics is much less integrated with the empirical side of economics than with the empirical side of the physical sciences. This is partly because, as I mentioned above, the conditions of economic empiricism are such as to make it difficult and uncertain. Nevertheless, in my opinion, economics will do well to follow the natural sciences still further (or even to lead them) in systematically calling to account the results of theoretical analysis, whether mathematical or not, before the tribunal of empirical evidence.

Third, the mechanistic view will reach the limits of its useful applicability at an earlier stage in the development of economics than it did in the development of physics, as Sebba suggested, for the interaction of the observer and the observed in economics makes its appearance as soon as one begins to discuss predictions and policy recommendations based on them. Thus the mechanistic view, if successful in leading to prediction, will bring about its own nemesis in economics. Perhaps the proper approach to this situation will be some adaptation of the theory of games, in which the economist or the policy maker is regarded as one player and the economy is regarded as another player or as a coalition of players.

I should like to conclude with a few remarks in defense of Allen's *Mathematical Analysis for Economists*. As far as I know, it is true, as Sebba says, that the word "matrix" is not mentioned in the book and that the chapter on determinants lists no economic applications. But this is not a fair picture. The chapter following the chapter on determinants is devoted almost entirely to economic applications, chiefly in comparative statics. And while Allen does not present matrix theory by name, he does provide his readers with the core of what it has to teach economists about systems of simultaneous equations—and this is the area in economics where matrix theory is most useful.

**HARLAN L. MCCracken:** Has the development of science in general and economics in particular come from patterns of reasoning—and model concepts—or has the science developed primarily out of the conditions of the time and period?



This is not precisely the same question as the old one, do times make the man or man the times, but similar ideas are involved.

We do know that thought patterns change, and with each change, the new or modified approach yields some advance to the science in question. We also know that certain great minds have "hustled history" in a marvelous way by their own original contributions.

All chemists know of Mendeleff and his Table. In his day there were 50 known elements in the world. According to his analysis, there were 92, 42 still unknown. These constituted the gaps in the Mendeleff Table. He showed exactly where the gaps were and predicted the precise nature of the element when found and isolated. This work created such a challenge to chemists then living that within ten years over half the gaps had been filled and now all 92 are isolated and are strictly according to prediction.

Again, the passing generation has been thrilled and challenged by the mathematical genius of Einstein. On his work, the noted Planck has built, demonstrating by pure mathematical theory, that all matter is energy in final analysis. He also "predicted" how much energy would be released by breaking down each element of matter into energy. Mathematics predicted the exact amount of energy which would be released by "smashing the atom." Now we have the atomic age and nuclear physics. Yes, a mathematically-minded, scientific age has hustled history in our day.

However, with this as a background, I would like to raise two questions. First, is there not much left to the economic interpretation of history? And, second, can mathematics be as vital and dependable in the science of economics as in the field of the natural sciences? I shall take up these questions seriatim.

First, then, can we agree with Dr. Pribram when he says that "the history of economic thought is largely a history of applied logical procedures. . . . And the idea that economic thought has been strongly influenced by the changing structures of economic life, is an idea most insignificant"? Dr. Pribram has developed a strong case for his point of view, so I shall not issue a categorical denial, but I do feel that economic life has influenced economic ideas quite as much as the reverse.

Some of my work was done with old Dr. Ely, and he told us that the two greatest words in the history of economic thought were evolution and relativity. On the latter point he stressed over and over again that the validity of ideas was highly relative to time, place, and circumstance. With this I still agree. Take for example the age of mercantilism, to which extended reference has been made. I do not think it came from a pattern of thought or from evolution in the field of logic. Now, of course, the philosophy of mercantilism was built up in a logical manner. The merits of a favorable balance of trade and the means by which it was to be achieved constituted a beautiful structure in logical analysis. But it was Gustav Schmoller who said: "The essence of mercantilism lies not in some doctrine of money or balance of trade, tariffs et cetera, but in something far greater. In its innermost kernel, it is nothing but state-making." (*The Mercantile System*, page 50.) And, since



many states were "in the making" at that period, who would pretend to say that the concept and doctrine of mercantilism was the product of a contemporary thought pattern or because logic had developed to a certain stage. Mercantilism was the product of the age and environmental conditions. It would have emerged if neither Mun nor Serra had ever lived. No other age of thought-pattern or reason could have given mercantilism its birth.

What was true of mercantilism was quite as true of the era of laissez faire and Adam Smith's *Wealth of Nations*. When the *status quo* begins to show a situation which is grossly unjust and indefensible, reasoning men work for a modification or overthrow of that *status quo*—both in philosophy and in fact. Quite naturally when a nation such as England raised the price of bread by governmental action, there was bound to arise a hue and cry of "repeal the corn laws."

Then, to make final reference to the most recent, and in some ways the most revolutionary, development in economic thought—Keynesian economics—would anyone contend that Keynes worked out his system of thought like an armchair philosopher? Is his system to stand as an analogue to *The Meditations* of Descartes? Again and again, we have been told that Keynes was never interested in theory as such. If he developed theory, it was for purposes of policy. He was a government economist in a period of deep and extended depression and vast unemployment. Is Keynes's *General Theory* the by-product of a thought pattern? Was it written and given to the world of 1936 because the models of Western thought had advanced to exactly that stage where such a work could be written? I think the answer to that question is negative.

And now for the second question. Can mathematics be as vital and dependable—predictable—in the science of economics as in the field of the natural sciences?

Mathematical economics has done much for our science in our day. It has rooted out errors arrived at both inductively and deductively. I have great regard for the value and merited worth of mathematics and the mathematical approach to many economic problems. But I do object to and challenge some of the exaggerated claims of mathematical economics.

The mathematical Keynesian has told us through the use of the multiplier and the acceleration principle just how much deficit spending it would take to reduce unemployment by a million men. I well recall when John H. Williams told us how he had been intrigued with the mathematical accuracy claimed by Keynes and Keynesians in this regard. Yet he himself remained most skeptical. I share that skepticism.

Yet Keynes himself was quite aware of the limitations of mathematical answers. For example, in his chapter on "The Theory of Prices," he gives his famous mathematical law: "So long as there is unemployment, *employment* will change in the same proportion as the quantity of money; and when there is full employment, *prices* will change in the same proportion as the quantity of money." (*General Theory*, page 296.)

Now many Keynesians have championed this law with mathematical rigor, yet Keynes follows immediately with five "complications" which prevent the

law from working out with mathematical precision. Surely we all see the wisdom of hedging here with necessary qualifications.

Professor Sebba has said that "a determined effort is being made to construct economic theory as a rigorous, quantitatively predictive science . . . the new thought tries to produce economic models analogous to physical world models, and since its concept of predictiveness is that of the modern sciences of nature, it will be well to start out with an examination of the concepts of model and mechanism in both areas."

Now I am all in favor of the "determined effort" and any progress which we can make in reducing economics to an exact science with a high degree of predictability is all to the good. But here, again, I find myself in a rather skeptical frame of mind.

In the field of prediction I suppose that the most ardent quest yet made by mathematical economists is in the field of business cycles and business forecasting—a field of great interest to me and one to which I have given considerable time and attention.

In a book published a few years ago, authored by Dewey and Dakin, they insisted that business forecasting was an exact science, that any cycle is represented by a sine curve, and that if we took the trouble to know the real nature of the cycle, the sine curve would be periodic and prediction virtually perfect.

Now, some of the greatest writers in the field of business cycles have reached the conclusion that there is no such thing as *the* business cycle. They observe that business fluctuations have a measure of rhythm, operating under the influence and impacts of multiple causation, with no definite sine curve evident. I readily recognize that mathematical treatment can treat a fluctuating curve in such a manner as to yield a sine curve with known periodicity and amplitude.

I well remember sitting in, many years ago, on a seminar by that great mathematical economist, Ragnar Frisch. He could start with a fluctuating curve, from which was evident to the untrained eye no trace of regularity or periodicity. Yet by performing a few "omega" operations, as he called them, the data were reduced to a beautiful curve of rigorous regularity.

However, mathematician and scholar that he was, he told us how these omega operations had been performed before a gathering of mathematical economists on the Continent. There was presented what appeared to be a curve with no apparent amplitude or periodicity, yet it was soon reduced to complete and beautiful regularity by a few omega operations. When the group was thrilled and almost dumbfounded by the results, they were mildly informed that the omega operations had been performed on a relief map of Europe.

Mathematics can give amazing results, and always the answer is precise—correct to the third decimal point, shall we say. But all too often in mathematical treatment certain relevant factors are omitted or left untreated because incapable of exact measurement. I am sure that I do not quite know what Professor Sebba means when he says that we can always provide as many equations as there are unknowns.

I see little hope of making economics an exact science by mathematical treatment or approach. And as for business forecasting, I feel that the number and direction of the various forces operating are too numerous and unpredictable in themselves to yield accuracy in the last analysis. I attended the round table on "Economic Forecasts and Their Accuracy." The observation made there by specialists in this field was that all forecasting had been only 60 per cent accurate and of ten systems used, the econometric models system had proved less dependable than those based on pure judgment.

A monistic theory of the business cycle is, for me, most unrealistic. Only an eclectic approach can be used and then prediction is highly tentative.

## TECHNOLOGY

### THE ROLE OF TECHNOLOGY IN ECONOMIC THEORY

By CLARENCE E. AYRES

*University of Texas*

During virtually the whole of their mature existence—that is, throughout the century that has followed the publication of Darwin's *Origin of Species*—the social sciences have been moving steadily in the direction of a unified field theory of human behavior, social structure, and cultural process. Economics has participated largely in this movement. Most of the empirical studies and most of the practical activities in which economists have engaged have been consonant with and contributory to this common understanding of man and society. But neoclassical price theory has not, for reasons which lie partly on the side of economic theory and partly on the side of general social theory.

On both sides a technological hiatus has been largely responsible. Lacking any notion of the technological process by which the industrial economy was coming into being, or even of cultural processes in general, or even of zoological evolution, the originators of the market theory of the economy therefore assumed mankind to be a special creation, endowed by "Nature" with aptitudes and propensities such as would bring the whole congeries of economic activities into equilibrium if only tyrannical governments could be induced to leave them alone. The whole theory of price equilibrium derives its significance from those assumptions; and since the assumptions are at variance with modern knowledge, the whole price-equilibrium theory of the economy stands by itself, aloof from the general theory of social organization toward which the other social sciences have been moving. But the other social sciences also have been singularly slow to assimilate technology to their general theory of social organization and have therefore widened the gap by which traditional economic theory has been isolated.

But technology will not always be misunderstood and cannot forever be disregarded; and as it is better understood, that understanding will enable economics to take its place in a unified field theory embracing all the social sciences.

In one sense, social inquiry is as old as inquiry itself, since there has never been a time when men have been unmindful of themselves. But there is also a sense in which the present scientific orientation of social inquiry must be said to originate in what has come to be known as the Darwinian revolution. Recognition of the zoological continuity of the human species with all other species implies the corollary that all human behavior must be susceptible to explanation in terms of the same physicochemical processes and organic functions which are observable in other organisms. But though it may be true that no man ever does anything except through the functioning of hormones, neurones, and all the rest of the organic apparatus, it has also been evident all along that what men do cannot be explained on the physicochemical, or even the organic, level of generalization. This does not mean, as some theologians still declare, that there is a gap in the operation of natural forces through which supernatural forces become operative. It means only that human behavior is predominantly learned behavior; and in order to understand it we must take account both of the physicochemical and cytological processes of the learning mechanism and also of what men learn. The latter, of course, is the field of social inquiry.

The social sciences are often treated as the dolts of the intellectual family. But when their achievements are considered in relation to their task, it is evident that they have been tremendous. Certainly the import of the social discoveries of the past century is not less than that of microbiology or nuclear physics. There is no operation of the human mind or heart so mysterious and no aberration so strange that students of such matters are wholly at a loss how to account for it.

Indeed, if we have any ground for complaint, it is that our colleagues have devoted themselves too exclusively to what is strangest and most difficult, to the relative neglect of what is most obvious and commonplace. Magic and superstition, the "golden bough," the "mystic rose," totem, and taboo have been the objects of world-encompassing investigation, with the result that we are now prepared to explain why some people eat their enemies and others expose their female children, and how ancient tyrants and modern dictators have managed to dominate their communities.

Thus it has become obvious that emotional conditioning plays a tremendous part in human life. Within broad limits, human beings can be conditioned to almost anything; and once they have undergone such domestication they seem to persist in the practices to which they have "adjusted" themselves with truly ferocious stubbornness (that is, like that of wild creatures) as though their behavior were dictated by their zoological heredity. This, of course, is what Sumner



meant by his celebrated dictum: "The mores can make anything right."

Investigations along these lines have produced a formidable body of knowledge which is the common possession of the social sciences. It is now generally agreed by social scientists of all fields that the ideals and aspirations, enthusiasms and aversions, the systems of beliefs and the conceptions of the universe and of human life by which the behavior of all the members of every community is largely guided—all go to make up a body of culture which each community has received from the past and passes on to its posterity by a process of indoctrination beginning in infancy and extending throughout life. It is also generally agreed that every community exhibits an organizational structure of great complexity by virtue of which all its members are tied to each other by bonds of sentiment, convention, contract, and decree, some loose and some extremely close; and that this social structure exhibits a sort of one-to-one relationship to the body of cultural tradition such that social structure and culture are obverse and reverse of each other. Social scientists are also generally agreed that in any given society the various features of the social system (whether regarded as a structure or as a body of culture) do not consist of a mere grab bag of more or less ill-assorted items, but that in every society some process of mutual adjustment is going on by virtue of which in every stable society all the features of the social system function in such a way as to complement the functions of all the rest.

This general agreement means that in spite of minor differences of terminology, emphasis, and interpretation, the social sciences have been moving in the direction of a unified field theory—one that covers the entire area of the social sciences. Nevertheless, for some reason social scientists have hitherto generally failed to assimilate technology. Probably that failure has been due in large part to the challenge of the mysterious and to the fact that seemingly there is nothing mysterious about tools and gadgets. They are, at all events, quite different from the mysterious promptings by virtue of which kinfolk cleave to each other. Obviously, the tools and gimmicks of any given people are a part of the cultural heritage of that people. No social scientist denies this. But the technological appurtenances of a society are quite generally treated as external—at least to the social structure of that society.

They are so considered partly because they seem to be identified with the physical environment and partly because they seem to be the work of individuals. In recent discussion of technology, words such as empirical and cognitive recur with suggestive frequency.

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This general agreement means that in spite of minor differences of terminology, emphasis, and interpretation, the social sciences have been moving in the direction of a unified field theory—one that covers the entire area of the social sciences. Nevertheless, for some reason social scientists have hitherto generally failed to assimilate technology. Probably that failure has been due in large part to the challenge of the mysterious and to the fact that seemingly there is nothing mysterious about tools and gadgets. They are, at all events, quite different from the mysterious promptings by virtue of which kinfolk cleave to each other. Obviously, the tools and gimmicks of any given people are a part of the cultural heritage of that people. No social scientist denies this. But the technological appurtenances of a society are quite generally treated as external—at least to the social structure of that society.

They are so considered partly because they seem to be identified with the physical environment and partly because they seem to be the work of individuals. In recent discussion of technology, words such as empirical and cognitive recur with suggestive frequency.

Technology is thought to be empirical in a sense that identifies it with the physical universe (and so dissociates it from the cultural universe of discourse); and the steam engine out yonder is thought to have been invented by James Watt's cognitive faculty (which likewise dissociates it from the cultural process by which loyalties and antagonisms are engendered).

Curiously enough, these two identifications contradict each other. For if technology is cognitive, it is not a feature of the physical environment but an aspect of human behavior—and one that is present throughout all human experience, as no one explicitly denies. Moreover, though the technological achievements of a given people are indeed manifest in their physical appurtenances, those manifestations are significant, or functional, precisely because of what those people do. Technology is doing—a mode of doing, perhaps, but one that runs through the whole gamut of human activities.

It is not only mean and humble tools—wrenches and screwdrivers—that constitute technology. Our technology embraces cyclotrons and electron microscopes, tensor analysis and spacetime relativity, Grimm's law and the concept of the frontier. Someone has said of the "ascending series of major chords on a root progression of minor thirds" with which Ravel dared to close his string quartet that "this progression has now become a cliché of modernism, and is even used to good effect in Hollywood movie music." In short, it is a common tool, now a part of the technical heritage of our society. Technology is workmanship, and it includes the workmanship of scientists and artists no less than the commoner skills we all acquire. Indeed, the validity of science and the universality of art both derive from the fact that both are extensions of common skills.

All skills are cultural. They are part—and surely a not insignificant part—of the body of lore from which individual human beings learn whatever they do learn. But it is true that all technological behavior patterns are objectified in tools, instruments, formulas, and notations of many kinds; and that fact is very important, for it is the basis of technological development.

All culture derives from past experience. But because technology is objectified in physical tools and apparatus, it is always capable of progressive development. Every tool contains—within itself, so to speak—the possibility of being applied in new situations to different materials and in different ways from its historic use. This process is the universal pattern of invention and discovery. All new devices are combinations of old ones, and so are all the discoveries of the scientists and all the creations of the artists. That is why subsequent

study reveals a developmental pattern—even a sort of logic—in the history of all the arts and all the sciences.

The same sort of pattern links the technological activities of all peoples and all ages. This is a truism, of course. No one denies it. But in the recent preoccupation of social scientists with the emotional conditioning which human beings undergo at the hands of their societies and the extraordinary variety of the beliefs and sentiments to which they have been able to adjust themselves, technological truisms have been brushed aside.

But facts are facts, and sooner or later they have to be reckoned with. Sooner or later the pendulum will swing the other way, and social scientists will realize that cognitive conditioning is no less important—and no less social—than emotional conditioning, and such recognition of the significance of technology will close the gap in the unified field theory toward which social science has been moving ever since Darwin's time.

That consummation will have two sets of consequences of profound significance for economics. For one thing, it will call for a reorientation of the whole conception of the economy. In its main outlines, that conception will be both simple and obvious. The production patterns of our economy are what they are because of the technical proficiency to which the Western peoples have attained. The machine process is the key to our productive powers. It is not as a matter of "wealth" or "investment" or anything of that sort that our machines are as potent as they are, although—our institutional system being what it is—the machines and appurtenances and materials of industry do also have such significance. But what makes them productively potent is their technical efficiency.

In its distributive aspect, our economy is what it is because the institutional structure of Western society is what it is. Who gets what is wholly determined by that organizational structure. This is the universe of discourse to which terms such as wealth and investment are truly pertinent, and also such terms as dividends, interest, rent, salary, wages, parity payments, poor relief, and social security. All these terms designate the various groups and strata into which the community is divided by the prevailing institutional system.

These two systems overlie each other and interpenetrate, condition, and complement each other in a fashion that is of course superlatively complex. Moreover, there is nothing automatic or self-regulating about it, any more than there is about family life or government or any other aspect of the social structure. To say this is not to deny the existence of the "self-regulating market," but only to deny the identity



of the market and the economy. The self-regulating market is a mechanism that implements the existing technological and institutional situation, to some extent and in certain particular respects. It does not create that situation on either the technological or the institutional side, and the equilibrium it (sometimes) reaches only registers the relative stability of the prevailing situation.

That such a reorientation of the theory of the economy has far-reaching practical consequences should go without saying. By far the most important practical consequence of the theory of the self-regulating market was its apparent justification of a social structure characterized by a high degree of inequality of wealth and income. To the prevailing philosophy, by which the institution of property had already been identified with the laws of "Nature," that theory added the doctrine of "economizing" (as it is called today), by which economic growth was attributed to nonconsumption; and since the prevailing social structure was well calculated to achieve "involuntary saving," its causal relationship to the process of industrial growth seemed to have been fully demonstrated.

We know today that industrial growth is a consequence, not of nonconsumption, but of technological development. No community has ever starved itself into prosperity. In undeveloped countries today the effort to catch up does not take the form of the enactment of sumptuary laws, but rather that of founding technical schools and establishing basic industries; and in the most advanced industrial communities it is now generally recognized that research is the key to further industrial development.

It is likewise highly significant that the hottest theoretical controversy of this century centers in the doctrine of saving. The shift of emphasis from saving to investment reveals a trend within orthodox economic theory itself toward a unified field theory of social organization.

Understanding of the role of technology in economic process requires the abandonment of the classical justification of economic inequality. This does not sound the tocsin of social revolution. What it does do is to leave the economic structure of society on the same basis as that of social structure generally. As a matter of fact, it leaves the institution of property almost exactly where landlordism has been for the past four to five generations. Nearly a century and a half ago the classical economists themselves "demonstrated" that ownership of land makes no contribution to economic growth. Since that demonstration seems to have had no effect on the continued private ownership of land, we seem to be justified in expecting that the

effect of similar treatment of the institution of property itself will have a similar effect—that is, none at all.

It is true, however, that the secularization of such an institution does open the way to modification. Relaxation of the belief that all marriages are made in Heaven has not led to the abandonment of family life. It is not even chargeable with the rising divorce rate. What is mainly responsible for the increase of divorce is of course the steadily increasing mobility—social as well as physical mobility—of the modern community. Nevertheless, it is doubtless true that the secularization of marriage constitutes a permissive cause. The willingness of the community to respond to changing conditions by modifying the law of marriage and divorce does reflect that secularization; and doubtless the same may be expected of the law of property, if that institution takes its place alongside all the others in a unified field theory of social structure.

In a sense, then, recognition of the dynamic character of technological process carries with it the realization that institutional change is inevitable. Is that process meaningless? Or is it susceptible to intelligent control? The fact of change implies the problem of policy. In recent years economists have been preponderantly of the opinion that no general economic policy is possible. But at this point, also, the progressive realization of a unified field theory promises a significant reorientation; and here, also, technology plays a major role.

The present-day conviction that no general policy is possible does not derive from the traditional theory of the self-regulating market and is not confined to the field of economics. It is rather an application to economics of the anthropological doctrine of cultural relativism. As the hedonistic, natural-order assumptions on which classical economic theory originally rested have been undermined by modern knowledge, economists have found in cultural relativism another assumption on which to ground their theory. This is the doctrine that human values are essentially irrational, having no other sanction than tribal sentiment. On this assumption, it would seem that the equilibrium of values which the market effects is the closest possible approximation to the general will and the only alternative to submission to the particular will of the reformer-dictator.

The doctrine of cultural relativism signalizes the wide diversity of human culture and therefore seems to bar the way to any unified field theory of social organization. Nevertheless, it is in fact another evidence of the trend toward unification. As modern social science got under way it faced a major obstacle in the cultural egotism of our

own society. Like all other societies, that of Western Europe has always thought of itself as following the only true religion and the only right principles of conduct; and for several centuries this attitude has been greatly intensified by the unquestionable technical superiority of the Western community. But any scientific theory of social organization must be equally applicable to all peoples. Social scientists have therefore—and quite rightly—sought to rise above the tribal sentiments of their own community and to recognize the universality of cultural egotism.

Up to this point their reasoning has been sound. The evidence is overwhelming and inescapable that all peoples do cherish tribal myths and are moved by tribal sentiments, both of which have no other basis or sanction than the emotional conditioning of all the members of each given community to the way of life of that community. But in their zeal to escape parochial bias, Western scholars have discounted the superiority of Western technology, and in doing so they have subjected themselves to the very bias from which they were seeking to escape. It is the belief of all peoples that their supposed superiority is due not to their tools and skills but to the favor of unseen powers. Although no community undertakes to raise corn without tools, each tribe attributes the success of its crops not to the tools or the circumstance of a favoring climate but solely to the pious performance of the tribal ceremonies and to the rectitude with which the tribe adheres to the principles of conduct laid down by their more or less imaginary ancestors. Thus in discounting the significance of Western technology, twentieth-century social scientists have not only succumbed to the lure of the mysterious; they have also taken myth, magic, and mores at their own valuation—not, to be sure, the myths and mores of their own community, but all myths, and all magic, and all mores. Hence there has arisen the doctrine that human life ultimately owes its guidance to the irrational element in culture and the derivative doctrine that economic policy likewise has no ultimate basis but the notions and sentiments of the community which the market registers as wants.

But this supposition itself has no basis but that of myth, and on sober second thought, that fact is bound to become evident to all students of the social sciences. Conversely, the technological criterion of betterment is a fact which is bound to be recognized the moment technology becomes the object of organized attention. The peoples of the corn culture do in fact owe their existence to their techniques of cultivation, and Western civilization is in fact superior to all others. Moreover, this is true not merely of the gimmicks that constitute the physical setting of our lives—our bathtubs and our central heating;

it is just as true of all the works of the human mind. We do well to recognize the merits of the artistry of primitives; but we should not forget that whereas we are able to recognize and assimilate their artistry they do not and cannot do the same with ours. This is also true of Western philosophy. We do well to recognize the intellectual achievements of other peoples. But in the effort to substitute reason for belief—to distinguish sense from tribally emotionalized nonsense—can anyone say that Western civilization has lagged behind any other? The truth is that we have been too modest, and in so doing we have failed to appreciate the significance not only of our own technology but of all technology. We have failed to recognize it as the life process of mankind and the criterion of human betterment. It is only that failure which has seemed to leave us dependent on the tribal *status quo* and its implement, the market.

The problem of general economic and social policy is that of making the most of our tools, of their potentialities as well as their present efficiency, by whatever institutional adjustments may prove necessary and possible. The complexity and difficulty of the task is axiomatic. That it is not impossible, our present level of achievement bears witness, notwithstanding all its manifold perplexities. Moreover, the achievements of the past have been accomplished without the benefit of any general theory of social action, even in the face of special, tribal theories to contrary effect. It is likewise axiomatic that the realization of a unified field theory of social organization would constitute a great step forward. It always helps to know what one is doing. This is the direction in which all the social sciences, including most of the activities of most economists, have been moving all along. All that remains is to bring theory into line with practice.

## DETERMINANTS OF THE DIRECTION OF TECHNOLOGICAL CHANGE<sup>1</sup>

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Technological change as we usually use the phrase in economic theory means a change in a production function which embodies all previously known techniques. In this sense, the introduction of a previously unused but known technique is not a technological change. It is simply a shift within the production function to a new ratio for combining resources. However, whenever we examine actual changes in techniques, we find it difficult to distinguish between the cases which are new techniques and those which are applications of already known methods.

Whenever a technique is put into operation where it was not formerly used, refinement and further development almost always occur whether it is new or old. If it is a technique which is being newly incorporated into the production function, it will usually have a history of previous unsuccessful trials. An examination of this history will reveal a course of development which on its surface is little different from that of the technique which was previously known but not economic under earlier ratios of resource prices. Both may have been commercial failures earlier although one may have failed because of technical nonfeasibility while the other failed because of economic nonfeasibility; the difference will not be shining clear. A market which is right for the particular resource combination used by a technique may grant success to a technically crude method while another far more technically finished method may appear to fail on technical grounds because the developers are unable to work it out in a direction which saves a sufficient amount of an expensive resource service.

Because of this operational difficulty with the usual definition, we will define technological change as any change in production methods in an enterprise or industry. Most changes will show as a change in the ratio in which resource services are combined, although it may happen that the ratio remains the same and all that occurs is a larger output from a given amount of resource services. (The larger output may be in the form of a new product which yields more utility rather than just a larger amount of an old product.)

<sup>1</sup>The research on this paper was aided by a grant from the Graduate School at Northwestern University.



Technological change defined in this way is primarily an endogenous variable moving in directions determined by economic forces. Even in the stricter definition generally used in economic theory, we would still argue that it is primarily influenced by economic forces rather than being an externally determined factor in the economic system. In other words, we not only have production functions which can be used to predict adaptations which will take place through the use of known techniques, but we also have production functionals which can be used to predict shifts in production functions resulting from investment in the development of as yet unknown techniques.

If changes in technology are of this character, this would reverse some of the cause and effect statements we have previously accepted. For example, instead of the rate of investment being influenced by the rate of invention or innovation, we would argue that the rate of invention or innovation is determined by, among other things, the rate of investment. Also, instead of arguing that capital-saving inventions or innovations cause a decline in the rate of investment, we would argue that a decline in the rate of investment causes innovations to become predominantly capital-saving.

The determinants of the direction taken by technological change may be analyzed and direction predicted if technological change is an endogenous variable. Before we can discuss the factors which press technology in one direction rather than another, however, we must know the points on our compass. Several compasses may be used. The selection of any one will depend upon our purpose in analyzing technological change.

#### *What We Mean by Direction*

One compass which might be used is a classification of the direction of technological change as cost saving, product improving, or novelty introducing. The automatic message accounting machine developed for the telephone industry, for example, is cost saving. Colored telephones are a product improvement (assuming subscribers prefer these to black instruments). The telephone itself is a novelty invention.

A change often does not fall neatly into one category. Just as our direction might be northeast, as well as north or east, a technique may fall between two directions. The dial telephone is both a product improvement, inasmuch as more accurate and faster telephone service results, and a cost saver (where labor is expensive and capital is cheap).

A technological change may be classified, not only in the preceding terms, but also in terms of whether it is capital-saving or capital-using in the technical coefficient sense. It would fall into the former

or latter category according to whether it reduced or increased the amount of capital used per unit of product. Recent changes in the pig iron industry provide examples of capital-saving techniques. Top pressure and oxygen enrichment reduce the capital required per ton of pig iron. Automatic looms in the textile industry are a capital-using change. They increase the amount of capital used per yard of greige goods.

The usual statistical measurements of capital use do not provide the information needed for indicating the direction change has taken, unfortunately. Most studies measure the amount of capital used with each worker or amount of capital invested per unit of annual output. To determine direction of change, we must know the change in the amount of capital services consumed per unit of product. Capital services consist of depreciation and interest. An example of divergence in measurement by these different methods is provided by the experience of the Japanese textile industry. When the industry shifted from the use of wooden buildings to re-enforced concrete structures, the capital invested per unit of annual output increased. Yet this was a capital-saving change and was worth introducing for no other reason except that depreciation plus interest cost per unit of product declined. The extra capital per unit of annual output was more than offset by the longer life of concrete structures. Depreciation dropped by more than enough to offset the rise in interest cost.

Capital-saving and capital-using have been used to designate changes which decrease or increase the marginal productivity of capital. A capital-saving change in the technical coefficient sense may be a capital-using change in the marginal productivity sense. A new technique which reduces the capital coefficient reduces cost. If demand is sufficiently elastic, price reductions will increase the rate of demand to a level where the industry requires more capital than formerly. In that case, it is a capital-using change in the marginal productivity sense if the ratio of capital to other resources is above the economy-wide average. Changes which reduce capital coefficients will be capital-using, in this sense, if capital costs are a sufficiently high proportion of cost and demand is sufficiently elastic.

Capital-saving in the technical coefficient sense may or may not be capital-saving in terms of marginal productivity. Changes which are capital-using in the technical coefficient sense will always be capital-using in the marginal productivity sense, if they are economic.

The latter variety of technical advance will always be labor-saving in the coefficient sense. It may, however, be labor-using from the marginal productivity point of view. Labor-saving and labor-using inno-

ventions may be defined in both the coefficient and marginal productivity senses in a manner parallel to the definition of capital-saving and capital-using changes.

Innovations may also be classed as skill-saving or skill-using. A new technique may require more hours of labor and more capital per unit of product than previously used methods; yet it may be worth introducing if it used labor of a lower skill level. Glass bottle machinery made a large cost-saving contribution by using labor skills of a much lower order than those required in handicraft shops. Skilled handicraft laborers had been paid in excess of 80 cents an hour. The Owens automatic made it possible to produce higher quality bottles with 20 cents an hour labor.

A technique classed as skill-saving for a particular industry may, nevertheless, be skill-using in the economy at large. An industry shifting to lower skill labor may recruit the labor from even less skilled occupations. The skills of these people may, as a consequence, be raised. There will not necessarily be a de-skilling of the men who otherwise would have acquired the high proficiency formerly required by the industry. They may acquire the high skills required by other industries. Insofar as this increases the skills supplied to other industries, the technique may result in skill-saving in the marginal productivity sense. However, if the larger income resulting from technical advance is used to demand products of the more highly skilled occupations, the net result may be skill-using in the marginal productivity sense. Also, it will be skill-using in the technical coefficient sense if the average skill used to produce each dollar of national product is raised.

Technical advances may be categorized according to whether they make markets more or less perfectly competitive. On first blush, any scale-enlarging technique may seem automatically to make markets less perfectly competitive. However, the fall in cost and price following the introduction of a scale-enlarging technique may enlarge the market by a larger proportion than the increase in optimum size of plant. The long-run result may be a larger number of firms and a more competitive market. Some scale-enlarging techniques, such as the patent still, have reduced the number of firms despite enlargement of the market.

Technological change which increases the number of products or introduces alternative methods of production may also make markets more competitive. The anthracite cartel, for example, has had its power reduced by the development of alternative methods for heating homes and by design of homes requiring less heat. Petroleum, coke,

natural gas, and fuel oil together with better construction, cheap insulation, and easily changed storm windows have made the demand facing the anthracite industry more elastic.

In terms of Keynesian concepts, we might label the direction of change in terms of its affect on the propensity to consume in both the functional and point sense. (The effect of change on marginal efficiency of investment is accounted for in terms of the capital-saving and capital-using compass already discussed.) Cost-saving changes which give rise to larger profits for a time and capital-using changes, in the marginal productivity sense, probably shift the propensity to consume curve downward (assuming that income from these sources goes to people with a marginal propensity to consume which is below the average for the economy). Also, insofar as the marginal propensity is below the average for the society, technological change which increases national income tends to reduce the average propensity to consume. However, product improving and novelty inventions are likely to shift the propensity to consume function upward. On this basis, we can probably account for the finding that average propensity to consume has failed to fall with a rise in income. Also, the nonreversibility of such changes could account for the finding that consumption fails to recede to former levels when national income declines to former levels.

We might indicate the direction of technological change in terms of the industries it affects. Broad categories such as manufacturing and extractive industries or primary, secondary, and tertiary industries could be used. Finer categories in terms of product could also be used. For certain purposes, it may be significant that the technology of the electric energy industry has advanced more rapidly than the technology of the shoe industry. For other purposes, it may be significant that the technology of manufacturing had advanced more rapidly than the technology of the extractive industries.

#### *A Graphical Analysis of Direction*

In order to identify some of the factors which determined the direction of change, let us use a graphical analysis. The techniques available for the production of any commodity may be represented by rays on a graph whose axes represent the different factors which may be combined to produce it. To keep the graph simple enough to reproduce on a plane, let us assume a commodity is produced with the aid of two agents which we will call labor and capital. A multidimensional relationship could be used with a dimension for each factor. For purposes of exposition, however, we will confine ourselves to a two-factor world.

Each technique may be represented by a ray. The different points on a ray represent different levels of production which can be attained by using different amounts of the factors, although always in the same proportion. Figure 1 is an example of the representation where rays *A*, *B*, *C*, and *D* are drawn for four different techniques which may be used to produce the commodity in question.

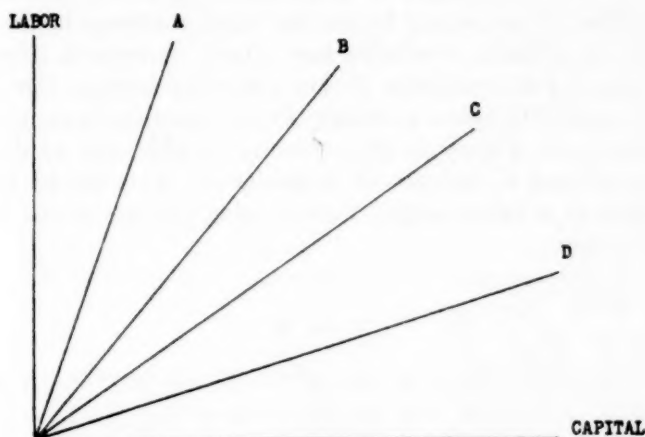


FIGURE 1

In Figure 2, an iso-quant has been drawn to show the factor combinations required with the different techniques to produce a given amount of product. If we wish to use a combination of factors which falls between those called for on any pair of rays, the combination can be employed efficiently by using both the techniques shown on the rays lying on either side of the point representing the combination in question.

If the society is a one-product economy, maximum production will result if factors are combined in the proportions in which they are available. The actual amounts of factors available can be represented by a point in the plane of the graph. If the point happens to fall on ray *A*, this is the technique which will yield maximum product. For example, if the amounts of labor and capital available are *a* and *b*, then technique *A* will yield 1,000 units—the maximum possible amount of product. If we were to use the more capital intensive technique *B*, we would be able to employ only the amount *a'* of the available labor. As a consequence of the limited amount of capital available, we would find ourselves operating on the 800 unit iso-quant if we use technique *B*. Less production results, then, than would with the use of technique *A*.



This represents the sort of mistake that is made in ambitious development programs for underdeveloped areas where capital is very scarce. If these areas would at first employ what may seem to be primitive techniques, instead of trying to imitate the techniques employed in capital rich areas, they would attain higher levels of national income.

With the aid of this graph, we can see that technological change may occur in either of two ways. In the first case, a change in the relative abundance of different resources may direct movement from, let us say, technique *A* to technique *B*. For example, suppose that a larger supply of capital becomes available. If the quantity become *c*; then, as we can see in Figure 3, the economy should shift to the use of techniques *B* and *C* instead of technique *A*. This would mean the introduction of a labor-saving, capital-using change in the technical coefficient sense.

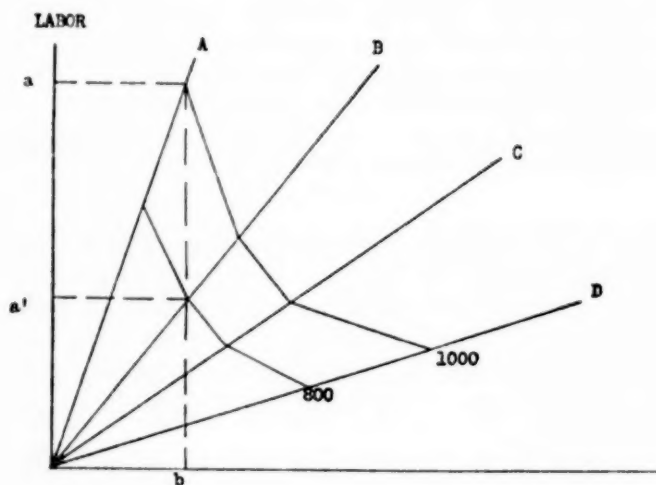


FIGURE 2

In the case of a change in resource availabilities, change will occur through a shift to already known techniques which employ relatively more of the now relatively more abundant resource. There is no change in the techniques known to be available. On the graph, then, there is no change in the rays shown or in the position of the iso-quant.

Technological change may occur without any change in the available resources. If new techniques are developed, this will change the appearance of the graph and may lead to a change in techniques employed in the economy. Suppose that the economy is in the situation shown in Figure 3. If a new technique, shown as *C'* in Figure 4, is de-

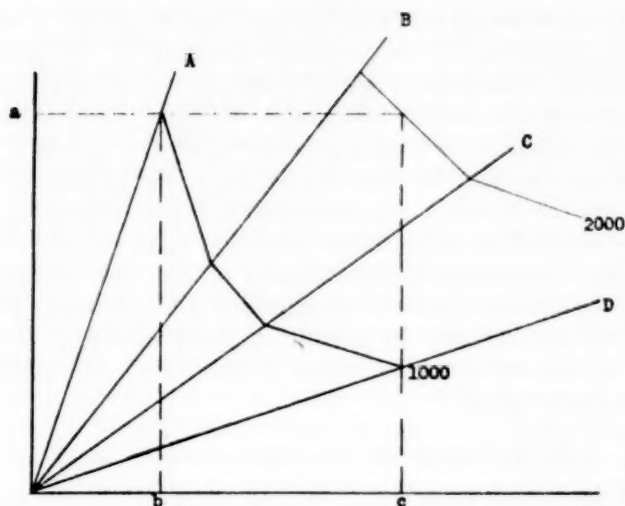


FIGURE 3

veloped and it shifts the old 2,000 unit iso-quant to the new position shown, then it will pay to drop the use of  $C$  and use  $C'$  instead (although it would be economic to use  $C$  if resources were available in different proportions). In this case, the production function which embodies all technological possibilities has changed. In the preceding case, the production function did not change, but the point of operation in the production function changed.

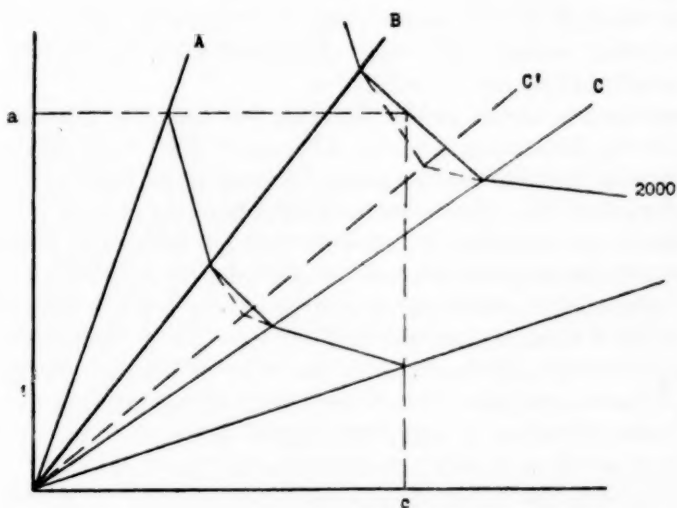


FIGURE 4

The ray representing a new technique may lie on top of an old ray. In such an instance, the only change showing on the graph would be a movement toward the origin of a section in each of the iso-quants.

To generalize the use of this graph, we must know how to select resource combinations for each product when the economy produces more than one product. In this circumstance, the proportion in which resources are combined in any one industry is not necessarily the same as that in which they occur in the economy. With the use of a budget line (a line whose slope is the negative of the ratio of prices of resources), the correct resource combination and technique can be determined for an industry in a multi-industry economy. The correct resource combination and technique is that where the budget line is tangent to an iso-quant.

#### *Determinants of the Direction of Change*

As was indicated, some types of technological change are adaptations within a given production function to changes in the relative availability of resources. Standard economic theory can tell us all we need to know about the direction this type of change will take.

It might be mentioned at this point that the attribution of a low level of investment in the thirties to a growth in capital-saving change relative to capital-using change reversed the causal forces at work. In the early thirties the banking system drained capital from the economy in such quantities that the economic system was unable to maintain its capital stock even with the use of the savings made available for investment purposes. As a consequence, business firms found it economic to shift to techniques using less capital per unit of product. Capital-saving changes were the consequence of the decline in the quantity of capital, not a cause of it.

A contributing cause to the development and the introduction of capital-saving techniques was the differential downward movement of prices in the thirties. Our monetary system is so constituted that a drain of capital from the economy by the banking system results in a reduction in the quantity of money. Prices fell under this deflationary pressure, but the response was not proportionately equal in all markets. The price of capital goods and of electric energy fell less than the price of labor. As a consequence, the ratio of the cost of capital services to the cost of labor and the ratio of the cost of electric energy to the cost of labor rose. Under these circumstances, engineering design was turned in the direction of using less capital and energy and more labor per unit of product in order to minimize private cost.

In addition to the adaptive response to changes in the relative availability of resources, a creative response may occur. When, for example,

the quantity of capital increases, not only may the economy shift to a known technique using more capital per unit of product; it may develop new techniques which use more capital per unit of product. As shown in Figure 4, the increased supply of capital would lead to the use of techniques *B* and *C* if no creative response occurs, but a creative response which leads to the development of technique *C'* is likely to occur under these circumstances.

In the absence of a relatively large supply of capital, there would be no use for technique *C'*. Its invention would be premature and a waste of inventive resources. With the bettered capital supply, the inventors of a *C'* technique would find a good market for their invention. With this motivation, this creative response is likely to occur.

Similarly, with a decline in the supply of capital, inventors would turn their efforts to the development of capital-saving techniques. The invention of capital-saving techniques as well as the adoption of previously known techniques in the thirties was a response to the decline in investment.

Technological change of either the creative or adaptive type are endogenous variables in the economic system. Only what might be called autonomous invention can be treated as an exogenous variable. However, autonomous inventions are as likely, if not more so, to introduce rays falling outside the area defined by rays *B* and *C*, which contains the probable economic combination of resources, as inside it. (A new technique falling outside this area will not be adopted unless it advances productivity very radically. Such an advance is not likely.) Also, they are as likely to require more resources for a given level of production than would be required with the available techniques as they are to require less. Autonomous inventions are often premature or inefficient. For this reason, their effect on the economic system is much smaller than the relative number of autonomous inventions might lead us to believe.

Autonomous inventions have less effect than they are usually credited with, not only for the reasons given above, but also because they are becoming a smaller proportion of the total amount of invention. Nearly 3 billion dollars a year is being spent for research in this country. Industry provides half of these funds. Since profit motivated investment in research seeks those developments which will bring profits, the direction research and development work takes is determined by the market. Libby-Owens-Ford research, for example, is directed by a committee which meets each week to talk over the current market for chemicals and decide priority of projects in the light of the current market. Most nonindustry financed research today is military research. Since it, too, is directed toward certain ends, largely deter-

mined by military economics, its output is largely determined by variables such as the relative scarcities of materials, capital, and manpower. The criteria used by the weapons evaluation group, whose findings are instrumental in guiding the military research program, are economic in character.

About the only autonomous invention which can be expected is from the output of nondirected research carried on by nonprofit organizations such as universities and foundations and by the people who love to tinker for the sake of tinkering. Since most nonprofit research is designed to add to knowledge rather than to the store of techniques, the output of techniques is small in comparison to the expenditure on the program. And the expenditure is small compared to that on directed research. About 100 million dollars a year is spent on nondirected research, and any output of techniques is a by-product to the search for knowledge.

Since most technological change is an endogenous variable, we should be able to account for the direction of change in terms of economic factors. The slower advance in the coal industry than in the petroleum industry, according to this generalization, can be explained by an analysis of the economics of the two industries. Also, we should be able to predict the direction of technological change from a knowledge of the relevant economic factors. We should be able to indicate which industries will enjoy more rapid advance and the direction that will be taken within each industry.

A qualification must be inserted, however. Because the nature of materials, technical problems, and the state of knowledge differ in different industries, we cannot completely account for differing rates and direction of technological change in terms of economic factors alone. We must also take into account purely technical factors.

For example, we might say that the rate of technical advance in expanding industries is more rapid than in declining industries. Yet we find a lower rate of advance in some periods of expansion in the textile industry than in some periods of decline in the railroad industry. The difference, however, arises largely out of the technical situation. Where technical situations are comparable, then economic factors such as the rate of expansion become important, for reasons indicated below. Usually, the technical situation in industry at one time is more nearly comparable to that in the same industry at another point in time not too far removed than it is to that in a different industry at the same time. In the textile industry we find more rapid advance in times of expanding output than in times of declining output (with some qualification for more or less rapid expansion or more or less rapid contraction).



The effect of the technical situation in determining directions of technical change may be seen very clearly in the electric power industry. Losses in power lines vary with the square of the current transmitted and directly with the resistance of the power line. For this reason, most research has been directed to discovering ways of transmitting given amounts of power with smaller currents. Little attention was paid to the problem of reducing resistance. Since the amount of power transmitted varies directly with voltage and current, given amounts of power could be transmitted with less current by increasing voltage. The major effort in reducing transmission losses has gone in this direction, then, because of the nature of the fundamental physical relations.

Yet, even here, choice of direction was finally determined by economic factors. It takes more capital to build a line of lower resistance than it does to build higher voltage generating and transforming equipment to attain the same reduction in power loss. The technical situation determines which method takes more capital, but the economic situation determines the choice of the approach.

Another type of technical factor which is important in determining the relative rate of advance in different industries is the state of science underlying the different industries. Because of the fact that the science underlying the chemical and electrical industries is in a much more advanced state than the science underlying the textile industry, we can expect the rate of advance to be more rapid in the former than in the latter industry. Again, however, it is the economics of the situation which is the final determinant. Advances can be produced more cheaply in science-based industries than in empirically-based industries. Therefore, capital is invested in research in the former rather than in the latter.

With this caveat in mind, let us turn to some of the factors determining the direction of change. We have already indicated the influence of the capital supply in determining whether technical change will move in the capital-saving or capital-using direction in the technical coefficient sense. In the nineteenth century with its rapid accumulation of capital, most change was capital-using. The technological changes in the transportation industries are an example of the capital-using changes which occurred. After World War I, however, the rate of saving began dropping. We find technological change shifting in the capital-saving direction.

In nineteenth-century America, there was great emphasis on labor-saving change. Because of the abundance of material resources relative to labor, labor costs were high to minds accustomed to a European frame of reference. Because there was capital in the form of natural

resources available (which could be converted into other forms) and also from economically advanced areas, capital intensive techniques were developed in order to save labor. Labor was saved in every way even at the price of using more capital.

Since World War I, the emphasis on labor-saving has continued, but by methods which are less capital-using. Labor rates continue high in spite of this because of the relatively great abundance of capital and because labor-saving in the technical coefficient sense has turned out to be labor-using in the marginal productivity sense.

As for the more rapid rate of change in some industries than in others, we have mentioned that an expanding industry will enjoy a more rapid rate of technological advance than a static or contracting industry. The reason for this is fairly obvious. If there is a large market for equipment, which will be the case in an expanding industry, it will pay to invest in development programs to produce better designed equipment. It will sell well and return the costs of the development program. The electric energy industry provides an example of this case.

In a static industry, such as flour milling, where not only is the industry static but also equipment is long lived, the market for new equipment is small. The company that invests in a development program may bring out superior machinery which captures the entire market, yet find the volume of sales at any price above cost too small to provide a return on its investment in improved designs for its output. Technological advance in such an industry will be relatively slow.

When we compare the rate of advance in the coal and petroleum industries, the slower rate of advance in coal is readily explained by the comparative cheapness of opening new coal deposits. The cost of finding new sources of coal in the twenties sufficient to replace those used amounted to only 2 per cent of the gross value of coal. The cost of finding new sources of petroleum amounted in the twenties to 25 per cent of the gross value of petroleum. Under these circumstances, it was relatively cheaper to find more coal than it was to develop methods of getting more coal out of the seams then being worked. Coal recovery methods improved very little, as a consequence, and it was common practice to leave 50 to 60 per cent of the coal supply where it was. In the case of petroleum, it was very expensive to find more petroleum. Investment in the development of better recovery methods could earn a good return and such investment was made. As a consequence, recovery percentages rose from 15 per cent to as high as 85 per cent as advanced techniques were developed.

Now that it is beginning to be more difficult to find high-grade, easily worked seams of coal, a similar development is occurring in the coal industry. Better mining techniques and coal preparation techniques

have been and are being developed and 70 to 80 per cent recovery is becoming common.

In discussing determinants of technological change, we have oriented the discussion largely around cost-saving change. Although this may seem more predictable than changes in design of consumer products, there are observations to be made in this area as well. For example, a low-income society will provide better markets for less durable, less capital-intensive, less complicated goods while the opposite is true of a high-income society. A cheap, simple automobile found a good market in the first quarter of this century. In the third quarter, such an automobile is outsold by expensive, heavy, complicated machines which provide not only transportation but comfort, entertainment, and ease in use. The difference may be associated with the difference in income and cost of capital to today's consumer and to the consumer of the first quarter of the twentieth century. Also, the relative cost of operation has its influence. Gasoline in the first quarter of this century had a higher real price than it does today. The design of an automobile is heavily influenced by the price of gasoline, as we can readily appreciate by examining those sold in areas of high-cost gasoline and comparing them with those sold in areas of low-cost gasoline.

### *Conclusion*

Since technological change is primarily an endogenous variable, perhaps we economists should no longer take technological change as an externally determined given in our models. Technology may be treated as a short-run given or perhaps an intermediate long-run given, since it changes slowly, just as we take the amount of plant capacity in an industry as a short-run given. In the long run, however, it changes in directions determined by economic forces just as the amount of investment in different industries changes in directions determined by economic forces. Just as we can say that the investment in one industry is going to grow more rapidly than that in another when we know the relative cost and demand conditions, so we should learn how to determine when technological change will be more rapid in one industry than another or more rapid in one direction than another.

Also, we may be able to say something more about the direction of change in interest rates relative to labor rates, and similar relationships, than we have in the past by acknowledging and analyzing the determinants and effects of technological change. If the cost of capital is very high relative to labor, then technological change will tend to move in the capital-saving, labor-using direction and redress the relationship. If the cost of capital is low relative to labor, then the opposite direction will be the tendency of technological change. Perhaps there is

some equilibrium relationship between the cost of capital (or the private return to owners of capital) and of labor toward which technological change tends to press. Disturbance of the ratio of private return on capital to the cost of labor by institutional means such as tax laws may redirect technological change in ways which may or may not be desirable. With better knowledge of the determinants of the direction of technological change, we may find it possible to devise our institutions more wisely than we have, perhaps, in the past.

## DISCUSSION

M. C. URQUHART: Mr. Brozen's very stimulating and informative paper covers many aspects of the study of the direction of technological change. His systematic presentation sets the matter in clear perspective. And the blend of economic analysis with supporting illustrative data is convincing.

My remarks largely involve qualifications that I would add to the discussion or matters on which I would place a somewhat different emphasis. They do not, in the main, reflect differences of opinion on major matters of substance. My comments cover three principal points.

The first of these concerns Mr. Brozen's conclusion that technological change is largely endogenous within the economic system and that, perhaps, economists should incorporate technological change as an endogenous variable in their models. This conclusion could come, in part, from the use of a concept of technological change which includes both the introduction of known but previously unused techniques when factor supplies (and hence relative factor prices) become favorable and the development of entirely new techniques. The selection of the best combination of factors from the production function in the light of relative factor costs is, of course, entirely an economic matter and, as Mr. Brozen implies, has for a long time been a part of economic models. But it is his contention that the discovery and development of new techniques, hitherto unknown, are also largely endogenous in the economic process. This is because the development of new techniques comes about now largely as a result of research directed to that end by businesses or government bodies. Consequently, owing to the economics of the situation, such research is likely to lead to the invention of new techniques in the area of the production function that is actually in use. And only "autonomous" inventions are as apt to fall in parts of the production function remote from those already in use as in parts near them. It is felt that since only a small part of research is of the autonomous type, this area of discovery has become small.

That there is much substance in Mr. Brozen's contention cannot be questioned. A large part of technological change comes not in the large spectacular new development but in numerous relatively small modifications of the production function. Cumulatively, these developments have large results. Since the economically feasible results come most easily in the area of the production function currently in use, business and government research tend to be oriented in that direction. But I have the feeling that a larger part of the new discovery than Mr. Brozen appears to imply must be treated as exogenous from the viewpoint of economic analysis. There are a number of reasons for this.

First, much of the fundamental research is still carried on by the universities and foundations. This type of research, which tends to lead to what Mr. Brozen calls autonomous inventions, probably has results out of proportion to the resources devoted to it. It may lead to the larger type of discovery that has



far-reaching results through much industry. Perhaps as good an example of this kind of thing as can be given is research in nuclear physics, which until 1939 was largely carried out in the universities. The breadth of the possible application of the development of nuclear physics to industry in general is obvious.

Second, developments that take place in one industry or area of production may have important applications in the rest of the field of production and it may be difficult to predict what these applications will be. There are many instances in which an invention in one sphere of production has had its most important application in other spheres. For example, in the history of the application of power, we find much of the development of the steam engine, in its very early stages, taking place in connection with pumping water. One of the most important applications of the steam engine, however—in rail transportation—came more than half a century after the development of the steam engine itself.

Third, discovery in one line of economic activity, while not having direct applications in other lines, may have important ramifications in them through affecting the nature of both product and factor markets. Such developments may both lead to shifts to techniques already known but hitherto economically unfeasible and, at the same time, stimulate efforts directed to invention. The repercussions may take many forms, varying as widely as from affecting the pattern of consumer tastes to making possible the introduction and development of large-scale methods of production. An example, in one area, of the results of this type of discovery may be seen in the effects of the development of the railway and steamship. The cheaper transportation led to greatly increased specialization and the introduction of mass-production methods involving, in many cases, much different techniques than those already in use. For instance, iron and steel production tended to become localized in a few areas and large-scale techniques came into use. Both the resulting increase in production and the increased specialization led to larger volumes of freight traffic. This greater volume of freight in turn was reflected in further developments in transport itself. As another instance of the same nature, one might also cite the effects of radio on tastes and on techniques of advertising. In our present state of knowledge in economics, it is very difficult to predict how invention in one part of the economy is apt to affect production in other parts.

Finally, it is perhaps more difficult to predict developments in the line of new products than in cost-reducing invention to which Mr. Brozen has devoted much of his attention. New products may frequently come as a direct result of research aimed at their development. Insofar as they come in this way, their discovery is much like that of endogenous cost-reducing invention. In many instances, however, new products come in perhaps unpredictable fashion as a result of the continuing accumulation of knowledge. And even if it is possible to predict the development of the product, it may be impossible to foresee the technical aspects of the problems of its production and hence what the economically feasible techniques of production will be. The development

of penicillin in the drug field is perhaps a good example of recent product discovery.

My second point deals with an elaboration of the discussion concerning the likelihood of inventions being labor-saving or capital-saving. (In these comments the terms are always used in the technical coefficients sense.) For this purpose it is desirable to distinguish carefully between the introduction of a previously known but unused process because factor prices vary with the introduction of a new invention. Mr. Brozen states that "when, for example, the quantity of capital increases, not only may the economy shift to a known technique using more capital; it may develop new techniques which use more capital per unit of product." In the light of his subsequent discussion, I take this to mean that if an increase in the quantity of capital takes place (causing the price of capital to fall relative to that of labor), it causes producers to shift within the (known) production function, let us say from a process using labor and capital in the proportions shown in ray *A* in any of his diagrams to the proportions shown in ray *C*. This shift, in itself, increases capital requirements per unit of product and lowers labor requirements. New inventions are then likely to appear in the area of ray *C* rather than ray *A*. These inventions might be said to be capital-using only in that they take place around ray *C* rather than ray *A*. They are not necessarily capital-using in the sense that once production has shifted to the process of ray *C* further inventions will likely lead to processes using still more capital per unit of product. Once production is on ray *C*, further invention, which moves the iso-quants towards the origin in the region of ray *C*, may conceivably lead equally to reduction in capital requirements as well as labor requirements. Since the quantity of capital in use is large and that of labor small, a reduction in capital requirements, even with the cost of capital relatively low, may give as great a saving in cost as a proportionate reduction in labor requirements even though labor is relatively expensive. It seems probable that historically the most important cause of the shift toward capital-using and labor-saving processes has been the movement along iso-quants within the known production function as the price of labor has risen relative to that of capital. Further inventions have then tended to take place in the area of the production function in use at the time.

There is some element of reality in the belief (not necessarily to be attributed to Mr. Brozen) that a rise in the price of labor relative to capital tends to cause still further capital-using invention even after shifts along iso-quants have been allowed for. It is economical to use a process depicted by, let us say, ray *C* within the range of relative factor prices that would, on the one hand, make the budget line fall along the iso-quant between rays *C* and *B* and, on the other hand, rays *C* and *D*. Within this range of variation, the lower the cost of capital relative to labor the more likely inventions are to fall on the side of ray *C* toward ray *D* rather than toward ray *B*, and hence the more likely inventions are to be labor-saving rather than capital-saving. And historically, of course, in the West in the last century or more the cost of labor per unit, with minor hesitations, has continued to rise relative to the cost of capital per unit.

My final point can be made very briefly. It is the fact, already referred to, that the size of the market may have important effects on techniques in use and hence on invention. For some products, large-scale production may quite well use one factor, probably capital, more intensively relative to labor than does small-scale production. Quite possibly, even with given ratios of factor prices, the large-scale process may involve lower costs per unit of product than the small-scale, but it may be economically unfeasible because the larger output of the large-scale method cannot be disposed of at a price to cover costs. This situation is apt to be of some significance even when markets become fairly broad where product differentiation is important. The effects of improved transportation in creating national or international markets and making possible large-scale processes is well known. Rising per capita income may have similar effects. The shift in the composition of demands as incomes rise has been widely discussed in the last two decades. For goods with a high income-elasticity of demand, only as per capita incomes increase does a market large enough to support large-scale production develop. Related to this is the fact that large-scale production tends to make large industrial research programs more feasible through the possibility of the spreading of research expenditure over a greater output.

IRVING H. SIEGEL: Professors Ayres and Brozen approach from opposite viewpoints the problem of introducing technological change into theory. The former's search for a "unified field theory of human behavior, social structure, and cultural process" is less likely to bear early fruit than the latter's program to extend the application of existing tools. In the long run, neither approach seems destined to succeed entirely. Meanwhile, the merits of each should be enlarged and the premature exclusive acceptance of either should be discouraged.

The general tone of Professor Ayres' paper will appeal to many. First, there are the numerous institutionalists and "practical" economists who have a low opinion of the usefulness of conventional theory. Then there are the researchers on technological change and the economic and social implications thereof who inevitably feel the need for some synthesis of the many disciplines dealing with their subject. Finally, there are the teachers who feel that courses with titles like "The Theory of Economic Growth" still lack some vital ingredient when organized only around such economic materials as business cycle lore, income-employment analysis, dynamic econometric models, algebraic exercises of the Harrod and Domar variety, and Rostow's "propensities." For many kinds of problems which arise in an economic context, it is certainly necessary to recognize technology and institutions as basic, though interdependent, categories; to recognize their influence on the other elements of a culture; and to view them as significant temporal variables. Professor Ayres' insistence on such ideas is certainly wholesome, but many of the specific points he makes will not appeal to all who share his general outlook.

I think that Professor Ayres grossly exaggerates the baleful influence of neoclassical theory and attributes too much significance to its preoccupation with price. In the days of Veblen, neoclassical theory might have been a much

worthier adversary than now. Even while Parsons was pursuing the institutionalist attack in the thirties, the theory was losing its dominant position. Other branches of economics were then coming into prominence, and neoclassical theory itself undergoing extensive expurgation. Among the increasingly popular rival or variant approaches were econometrics, economic statistics, mathematical economics, welfare economics, the theory of monopolistic competition, Keynesian and other macroeconomic systems, and functional finance. With the widespread adoption of the Robbinsian outlook and of the techniques of indifference curves and mathematics, neoclassical theory tended to become a deductive discipline: a set of principles for the rational allocation of scarce resources to alternative ends rather than the description of a subject-matter field. It would seem fair to say that Marshall's mathematical appendix replaced the text of his *Principles*—that neoclassical theory now has a technical status similar to that of, say, the theory of games or linear programming. In its own way, the theory is equipped to take account of technology—through the static, linear homogeneous production function, the market aspect of which (i.e., the productivity theory of wages and of distribution in general) has usually been stressed. It does not pretend to deal with technological change, though Brozen's approach indicates how this extension might be made.

If neoclassical theory is not altogether a proper target, then what other extant theory is? The one which immediately suggests itself is Marxism (and its subsequent refinements). This system, unlike neoclassical economics, does purport to take account of technological change, assigns to technology a central role in economic and social evolution, asserts the impermanence of institutions and the relativity of ideologies, insists on the social character of "cognitive conditioning," etc. By telling us how this catholic instrument of analysis and blueprint for social action differs from the "unified field theory" which he himself seeks, Professor Ayres might have given us a clearer picture of the path he urges us to take and the place to which it leads.

Still other branches of economic study which Professor Ayres ignores are relevant targets. Should not economic history and the comparative study of economic systems have contributed more than neoclassical economics to unified theory? These disciplines have not, however, pressed energetically the search for "general laws" of development—a pursuit deemed most worthy by Condorcet, Hegel, Mill, Comte, and other precursors of modern unified theory.

Professor Ayres' explanation of the failure of social scientists to assimilate technology is unconvincing. It is hard to believe that they find nothing mysterious about tools and gadgets. "Occupational relativism" may provide a better clue. The compartmentalization of our educational system normally discourages the future social scientist from straying into technological pastures. The traditional bias of his education may well lead him to believe that, as a commentator, he is superior to a doer; that he is more likely than, say, an engineer or mathematician to embody the worth-while values and perspectives of civilization. But new circumstances (like the challenge to national survival) are making the physical scientist, mathematician, and engineer more respectable. The curricula for such specialists will doubtless be broadened to include more of the humanities and social studies. An increasing number of new

technological "barbarians," who will experience less difficulty in learning the fundamentals of economics than economists usually experience in learning mathematics, will doubtless spill over the traditional boundaries of the social studies. The history of economics is studded with the names of illustrious amateurs—of persons who were not primarily trained as economists or did not regard themselves as such. Current journal literature already foretells a bright future in economics for those whose education and experience reflect the "confusion of the genres." The unification of social theory around a technological core is more likely to be advanced at the crushed zone of contact of diverse disciplines than by the conversion of neoclassical economists to a broader outlook.

Professor Ayres' concluding paragraphs could detain us endlessly. Assuming that technology is indeed "the life process of mankind and the criterion of human betterment," how can we proceed further to agreement on the details of a "general economic and social policy" aiming at the maximum development and use of tools, institutions notwithstanding? If lethal weapons and dictatorship are ruled out, agreement is achievable only through resort to the notions of marginalism, interpersonal comparisons of utility, social welfare functions, and the other paraphernalia of neoclassical economics and its close relatives. When resources are limited, what other rules can there be for establishing the priorities of conceivable worth-while projects?

At this juncture, we return to Professor Brozen's paper, the title of which might well have been, "Toward an Economic Theory of Technological Change." In capable hands such as his, the tools of conventional theory are bound to produce illuminating results when applied to the field of technology. But such instruments must also be of limited avail because technological change has many noneconomic dimensions and involves choices which can more easily be rationalized in retrospect than in advance.

Indeed, Professor Brozen's treatment of the predictability of technological change is one of the weak points of his paper. It is not sufficient to say that technological change is an "endogenous variable" and that its direction is "determined by economic forces." To know that the future will emerge from the matrix of past history and present circumstances does not give us the power to predict particular events, their timing, and their consequences. The problem of setting up a model which anticipates the course of change correctly and convincingly, of proceeding from a statement of the possible to a statement of the inevitable, remains. Autonomous innovation can always occur even if autonomous invention is of diminishing importance. Prospectively, we have no way of telling whether the response to a challenge will be creative or adaptive. MacIver's "myths" are as important as "economic forces" in determining long-run directions of change. The economic component of a complex decision cannot tell the whole story. Actual behavior is not the same as the quasi-economic or pseudo-rational choice to which it might be reduced by a dispassionate historian. Theorizing requires us to play as if such treatment of behavior were adequate; but we must not confuse the game with what people really do, which is really more important for prediction. In short,



Professor Brozen's "compasses" may be better suited for describing directions already taken rather than the routes still to be traveled, for bringing a log-book up to date rather than setting the course.

While Professor Brozen overemphasizes the economic component of technological decisions, he neglects at the same time to introduce explicitly various concepts needed to give the appearance of completeness to his quasi-economic or pseudo-rational system. For example, he makes no use of the important notion of a time horizon. The justifiability of a technological decision by its ultimate payoff disposes of the awkward idea of "premature" inventions and may be invoked to explain why national leaders seek such inventions (e.g., the atomic bomb) at great cost. The notion also imparts sense to the development programs of backward countries, which need not be making a "mistake" in aping the capital-intensive techniques of industrially advanced nations. Similarly, it would help to explain the stocking of inventions by research-minded firms. Such firms are not interested merely in "current market" advantage. They are also interested in achieving long-term security through monopoly and stability through diversification. Taking account of present and anticipated tax laws, they may be presumed to prefer future to present dollars of gross income or increments of wealth to increments of income. The notion of time horizon is also needed to explain the "Promethean" equilibrium-breaking behavior of the inventor and the innovating entrepreneur and investor. These types act as if they set a higher present evaluation on incomes derivable from novel projects than on incomes derivable from conventional employments. If their anticipations are validated by subsequent experience, they did not waste resources; their behavior was economic in retrospect. Many other useful concepts might be introduced, like the "cost of change"—a notion needed to make appear rational the commonly observed failure to adopt available superior techniques.

Professor Brozen refers to the historical shift in emphasis in our country from labor-saving to capital-saving techniques. It may be conjectured that, as industrialization advances and the stock of potentially useful knowledge increases, invention becomes both capital-saving and labor-saving; that is, cost-saving in general. Such a trend would seem inevitable even if emphasis were focused entirely on labor-saving, since the methods of satisfying a general class of wants typically become more roundabout through time.

A few other comments might be made on Professor Brozen's paper. For example, he fails to mention declining interest rates in explaining the capital-saving emphasis of the innovations of the thirties. His discussion of automobile design overlooks the noneconomic accident of Henry Ford and ignores the possibility that a similar personality could once again revolutionize the industry (e.g., by appealing to the latent market for a first or second family car which is cheap, sturdy, and parkable). His brief prefatory remarks on the nature of technological change and his definition of such change in terms of "production methods" are very inadequate, even for his subsequent discussion. Finally, more thought should be given to the definition and variety of the "resource services" relevant to the discussion of technological change.

I must add that no brief discussion can do complete justice to the papers of Professors Ayres and Brozen—papers which themselves only briefly sketch ideas which they have presented elsewhere at greater length.

W. N. LEONARD: Professor Ayres has for some time been beating the technological drum in what has obviously seemed to him a wilderness and has now obtained considerable reinforcements from sociologists, anthropologists, and at last even economists. There can be no argument with him that, excepting Karl Marx who introduced it as a deterministic and disequilibrating force, technology was neglected by classical economists. This neglect persisted even into recent years when the impact of technology had contributed to a revolutionizing of economic organization in terms of complicated processes involving thousands of individuals which made the atomistic and competitive social conceptualization of the earlier economists almost totally obsolete. Even at this late date many economists have held to traditional theory, merely adding a declining marginal revenue curve for the monopolist and the concept of elasticity of substitution of resources and products. But, as Professor Ayres states, the obvious cannot always be overlooked. The work of the National Bureau of Economic Research, the Twentieth Century Fund, and other organizations in studies of productivity bears witness to the current interest of economists in the contribution of technology to work and wealth.

However, a recognition of the importance of technology is not equivalent to an understanding of its role as a tool of culture or its impact upon socio-economic processes, and such an understanding is one of the most challenging tasks facing the social sciences. Professor Ayres, if I have not misunderstood him, appears to adopt a theory of social Darwinism, which views social development as a mechanical and unilinear process emanating from the cumulatively progressive character of tools and machines. It is of course true that technology, like law, builds upon precedents, illustrated in Sir Isaac Newton's classic remark: "If I have seen further, it is by standing on the shoulders of giants." But Newton's remark presupposes that the standing-on-shoulders had as its objective better visibility; in other words, motivation underlies the technological act.

Alfred North Whitehead once said: "To come very near to a true theory, and to grasp its precise application are two very different things, as the history of science teaches us. Everything of importance has been said before by somebody who did not discover it." The attitude of the discoverer and his situational context have much to do with invention, while social acceptance or resistance are determinants of technological growth.

Professor Ayres speaks of technology as "objectified in physical tools and apparatus." One can also describe technology as subjectified in attitudes of man towards tools and apparatus, from which are derived know-how and "make do." The Chinese invented papermaking, printing, and gunpowder, but these discoveries had a negligible impact upon Chinese economic and social life. Hero of Alexandria, Egypt, developed a steam engine in the second century A.D. but it was used as a toy. Both Marx and Schumpeter pointed out that the acquisitiveness of capitalists represented a catalytic agent for the

introduction of machines during the Industrial Revolution. The tool and machine are not self-contained and self-determining; rather they are instrumental fragments of complicated attitudinal and behavioral patterns involving the whole of culture. Institutions (a term commonly used to denote these attitudinal and behavioral relationships) form the framework of culture in which the machine is precipitated and in which its function is consummated. Opposition arises, not between technology and institutions, but between various sets of institutions, for example, making goods and making money, engendered in part by changes in organizational relations brought about by the machine.

That there is a developmental pattern, as Professor Ayres says, one cannot but agree. Just what that developmental pattern is, however, remains a matter for considerable speculation and continued investigation by social scientists. Any theory of unilinear development runs head-on into serious obstacles; for example, the hiatus in scientific achievement between Greek and Hellenistic science and the age of Galileo. Furthermore, as Schumpeter pointed out, the history of technical progress in recent centuries reveals great discontinuities and clusters of innovations whose introduction at irregular periods increases the amplitude of business cycle fluctuations.

It is somewhat ironical that the decade in which the greatest downward movement of economic activity occurred—the decade of the thirties—witnessed the greatest increase in productivity: the studies of the Twentieth Century Fund indicate an increase of 42 per cent in productivity during the 1930-40 decade, compared to an 18 per cent average per decade for the century 1850-1950. The gain in productivity of the thirties resulted from changes in the labor-capital ratio and the discharge of less productive workers, as well as from the introduction of new machines and processes. In December, 1952, the National Bureau of Economic Research reported that 26 per cent of the gain in output afforded by greater productivity had in recent years gone into defense and war production. Bomb-making is also cumulative. In the face of this evidence, one cannot adhere to the belief that technology carries within it the seeds of its own use, or that it offers an inherently progressive force in human affairs.

Professor Ayres emphasizes an important point; that cultural relativism, long held by sociologists and anthropologists, has encountered the trend of backward peoples to adopt industrialism and other institutional aspects of Western culture at such a rate as practically to exhaust the supply of primitive peoples, thereby contributing perhaps to unemployment of anthropologists. The evidence indicates a direction of imitation among cultures in favor of an advanced technological system.

I should like to comment on Professor Ayres' statement that the "most important practical consequence of the theory of the self-regulating market was its apparent justification of a social structure characterized by a high degree of inequality of wealth and income." Such inequality considerably antedated the theory of self-regulating markets. Furthermore, in the Soviet system, which makes much of its technical originality and proficiency, inequality of income has been retained and even increased. This is not to say that greater equality of income may not in some historical periods result in greater de-

mand for industrial output and, perhaps also, a quickening of the technological tempo. The relationship between technology on the one hand and propensities to save, invest, gain, spend, work, or seek leisure on the other are matters for continuing investigation by economists and other social scientists.

Professor Ayres several times refers to the movement of the social sciences towards a unified field theory and one could wish he had been able to provide a more graphic picture of this trend. As Professor Katona has shown in his book, *Psychological Analysis of Economic Behavior*, the field represents: (1) a means of breaking down interdisciplinary conceptual barriers between the social sciences and obtaining a contextual unity in which behavior can be analyzed; (2) a mechanism for assimilating all elements of a situation into a space-time framework that can be extended spatially and temporally backwards and sideways. The field of a particular factor is its coexistence in a simultaneous spatial context, or its backward extension temporally in terms of antecedents, each with its separate contemporaneous context.

But in any given *Gestalt* or situation, how are we to determine significance? That two factors coexist does not mean that they are of necessity causally related. Hence some other analysis must be made in order to derive determinism, a sequential analysis of variance which will permit the assignment of social valence to factors whose coexistence may be fortuitous rather than significant. Without a theory of significance, or structural determinism, the field becomes merely an elongated blur.

Even if completed, such a "field theory of social organization" will constitute only a model, probably more sophisticated than the economic man and the self-regulating market of classical economics, but one whose validity could be established only by constant check and correction. With a model oriented more realistically towards an increase in human welfare, the correction of practice to conform to the theory might be of equal importance with the correction of theory to meet the test of practice.

## ECONOMICS IN THE CURRICULA OF AGRICULTURAL COLLEGES IN CANADA AND THE UNITED STATES

### INTRODUCTORY REMARKS

*By JOHN D. BLACK, Chairman*

Ordinarily the chairmen of sessions confine their remarks to introducing the speakers. I am going beyond this for reasons that will be apparent. President Stewart has reported that 10 per cent of the upperclassmen in the six Canadian agricultural colleges are doing major work in the economics of agriculture. A survey which I am in process of making indicates that the comparable figure for the United States is around 12 per cent. The returns from thirty-nine such colleges in the United States, with 31,000 students enrolled in agriculture in all four years and probably about 10,000 upperclassmen, indicate 1,600 majors in the economics of agriculture. The range is wide, from as low as 5 or 6 per cent in two to as high as 30 per cent in two. But these percentages need qualification. In the colleges with the higher ratios, the curriculum for a major in economics of agriculture tends to require much less economics than in colleges with the lower ratios. In several of the colleges, the major in the economics of agriculture is much like the curriculum in "general agriculture" offered in the other colleges. An economics major in these colleges is designed to turn out a young farmer, beginning county agent, or apprentice in a firm doing business with farmers. Other departments try to turn out as majors men who are ready to do research, take government jobs, or enroll as graduate students.

Of the remaining nine agricultural colleges, at least five have no majors in agricultural economics, but instead a curriculum in general agriculture, or "agricultural business," or no majors of any kind.

President Stewart has spoken of the wide range of differences in the provision for economics in the agricultural colleges of Canada. Surely the differences are no greater than in the United States. The forty-three agricultural colleges in the colleges from which reports have thus far been obtained have twenty different arrangements for required courses in economics and agricultural economics. The most common arrangement—the general economics given in principles in the university required of all agricultural students—is found in colleges with 30 per



cent of the agricultural students. The next most common—14 per cent of the students—is a required course in the economics of agriculture after the required course in principles. Third in order—11 per cent—a required course in principles given in the college of agriculture and adapted somewhat to agriculture. Fourth in order—10 per cent—a required principles course or economics of agriculture, according to the curriculum or election of the student. Fifth—5 per cent—one semester of general principles and a choice of agricultural economics or more general principles in the second semester. Only 3 per cent of the students are in colleges requiring agricultural economics only. Of the remaining institutions, four are requiring some course like agricultural geography or "economic trends" in the first year as preparation for a general principles course.

Several letters which I have received indicate a considerable dissatisfaction with requiring agricultural students to take the same general course in principles as is offered as an elective in the liberal arts college, saying that it introduces considerable refinement of some principles that is not significant in agriculture at the expense of some, like those of production economics, that are highly important in agriculture.

## ECONOMICS IN THE CURRICULA OF AGRICULTURAL COLLEGES IN CANADA

By ANDREW STEWART  
*University of Alberta*

This paper is divided into two parts. The first part describes briefly the organization of the agricultural colleges in Canada, the programs of studies in them, and the content of economics in the several programs. In the second part, some features of organization, programs of studies, and course content are discussed in such a manner as to disclose the prejudices of the writer.

### *I. The Agricultural Colleges in Canada*

An "agricultural college" is defined as an institution offering a program of studies leading to a degree in agriculture. Some institutions (e.g., Nova Scotia Agricultural College) offer a diploma course on the completion of which students may, by arrangement, proceed to other colleges for the work required to complete a degree program. All the colleges in Canada, with the exception of the Faculty of Agriculture, University of Alberta, offer diploma courses in agriculture. The degree commonly awarded is the Bachelor of Science in Agriculture (B.S.A.); McGill University, through Macdonald College, designates its degree as B.Sc.(Agr.); while the University of Alberta awards a B.Sc. degree to students graduating from the Faculty of Agriculture.

The colleges to which reference is made in this paper are Ontario Agricultural College, Macdonald College, McGill University, and the Faculties of Agriculture at the Universities of Manitoba, Saskatchewan, Alberta, and British Columbia. The total number of students registered in the degree courses at the six colleges is 1,029. Of these, 502 are in the options of the two senior years and 50, or 10 per cent, are specializing in agricultural economics. From reports received covering forty-eight courses offered to agricultural students in the six institutions, the numbers enrolled in the courses were distributed as follows: fewer than 5 students, sixteen courses; 5-9 students, eleven courses; 10-30 students, twelve courses; 30 students or more, eight courses. The colleges report 43 graduates pursuing postgraduate studies in farm management, agricultural economics, or economics, ten of these in Canadian institutions and thirty-three in the United States.

Across Canada the pattern of organization is varied. There are several reasons for this. First, Canada is a country of two cultures. No

simple comparison between the systems of education in Quebec and the systems in the other provinces is possible. For this reason, the discussion in this paper is confined to the English-speaking colleges.<sup>1</sup> Second, education is a provincial responsibility. The government of Canada supports research at the colleges and federal research workers are located at most of these. However, federal employees do not engage in instruction or in the extension activities associated with the colleges. The Dominion, therefore, provides no formal influence tending to uniformity. Third, the educational systems and the agricultural colleges were established in different periods. Universities and liberal arts colleges, usually privately supported, were established early in the development of the Maritime and Central Provinces. Here the agricultural colleges were established later, sometimes under government auspices, to provide technical and professional education in agriculture. The province of Manitoba, created in 1870, followed the eastern pattern. The Manitoba Agricultural College was established in 1906 as an independent though affiliated institution and did not become a faculty of the University until 1924. The western provinces, including Manitoba, adopted the policy of incorporating only one degree-granting institution, the Provincial University. When the Universities of Saskatchewan, Alberta, and British Columbia were established provision was made for a faculty of agriculture at each institution.

The agricultural colleges in eastern Canada remain geographically detached from the universities. Ontario Agricultural College is located at Quelph but is affiliated with the University of Toronto which grants the degree. Although Macdonald College is situated twenty miles from Montreal, it is organized as a faculty of McGill University. Most of the instruction is taken at the College, but some studies may be taken at the University. In Manitoba, the present Faculty of Agriculture was originally an affiliated college on a separate campus. In time it became a faculty of the University and eventually the University moved over to the campus of the College. Today the situation in Manitoba parallels that in the other three western provinces. In Saskatchewan, Alberta, and British Columbia, instruction toward the degree in agriculture has always been an integral part of the work of the University, within the Faculty of Agriculture, on the site of the University.

In the detached colleges, with the exceptions noted in the case of

<sup>1</sup> L'Université Laval and L'Université de Montréal offer degrees in agriculture, the former through Faculté d'Agriculture, Sainte-Anne-de-la-Pocatière, and the latter through L'Institut Agricole d'Oka, La Trappe. In each case admission is with the B.A. (Collèges Classiques) or by examination; and the course extends to four years. Specialization is possible in the fourth year. All students are required to take half-courses in principles of economics, accounting, farm management, and marketing. At Ste. Anne, the second term of the fourth year is reserved for electives in economics. At La Trappe, electives account for about half the instructional time in the fourth year. The courses offered are half-year courses.

Macdonald College, it is necessary to establish at the college all of the departments or qualified instructors required for the degree program of studies. In the faculties of agriculture in the western universities, the science courses basic to the applied agricultural courses are usually provided in the appropriate departments of the faculty of arts and science; i.e., they are offered by instructors appointed to these departments. The specific classes may be open to students in other faculties; or, when class numbers are large, the agriculture students may be instructed in a separate section; or, in some cases, there is a separate course for students in agriculture. The diversity of arrangement suggests that the actual decision rests as much on administrative convenience as on educational philosophy. Apart from the basic sciences and the applied agricultural courses, the two subjects commonly included in the curriculum are English and economics. The arrangements for the course in English are similar to those in the case of the basic sciences; i.e., the department of English, faculty of arts and science, serves the faculty of agriculture.

Arrangements for the teaching of economics vary. The two eastern colleges have their own departments of agricultural economics (Ontario) and economics (Macdonald). In Manitoba and Alberta there is no department of economics, agricultural economics, or farm management within the faculty of agriculture. Instruction to students in agriculture, in any of these disciplines, is given by members of the Department of Economics (Manitoba) and the Department of Political Economy (Alberta). The University of Manitoba has two specialist instructors; the University of Alberta has one. In Saskatchewan and British Columbia, the Faculty of Agriculture has a Department of Farm Management (Saskatchewan) and of Agricultural Economics (British Columbia); and in each case the department is staffed with two instructors.

*Programs of Study at the Colleges.* The typical pattern of the degree program in Canadian agricultural colleges is admission with senior matriculation, two years common to all students, and two years of specialization before the baccalaureate degree. In the senior years, the programs include a "general option," several specialist programs in the agricultural sciences, and an "option" in farm management or agricultural economics.

In most colleges, one course in economics is required during the common years; but, customarily, several of the specialist options do not require any economics. Consequently, while few graduates from Canadian agricultural colleges manage to avoid any exposure to the discipline, probably most of them have not had more than one course. In the common years, the emphasis is on introductory courses in the

agricultural departments and on basic science courses. Typically, the first two years provide for one course in English and one in economics. The only significant deviations from the normal pattern are the requirement of courses in both English and economics in each of the two years, at the Ontario Agricultural College; a required course in farm management and marketing in the second year at the University of Manitoba; and a relatively flexible arrangement of compulsory and elective courses at the University of British Columbia.

Each college provides for several optional programs in the senior years. The number of options open to students in agriculture may be as high as seventeen. In some colleges the curricula for the specialist programs are fairly rigidly prescribed; and several programs do not make provision for any economics. In other institutions no rigid program is prescribed and the courses are worked out in consultation with the department, or some courses are required but there is a fairly wide choice of electives. However, it is probable that in these more flexible programs the content of economics is actually slight.

The general option is described as offering a "broad" or "general" training in agriculture; or, as in the words of the Macdonald College calendar, "it is arranged to meet the requirements of students who wish to give special attention to combinations of subjects which are not provided for otherwise." The program is therefore more flexible than the specialist options and there is greater opportunity to include nonprofessional courses. Ontario Agricultural College has no general option. In Manitoba, one course in economics may be elected, but none is required. Alberta and Saskatchewan require farm management; and general option students in Saskatchewan may elect other courses in agricultural economics. Macdonald College requires half courses in each of marketing, economics of agriculture, farm accounting, and farm management. In British Columbia all senior subjects, including economics, are elected. Thus typically the student in the general option will get more agricultural economics than the student in the specialist option; although in some specialist options the content of economics may be as great or greater.

*The Agricultural Economics Option.* Each of the colleges has one specialist program in economics; Saskatchewan has both farm management and economics; and British Columbia has agricultural economics and commerce. All programs include in the senior years some technical courses, some satellite subjects, and courses within the general field of economics.

The subjects referred to as satellite are accounting, farm management, statistics, co-operation, and sociology. Where the colleges were early established as detached institutions, there has been a tendency



to differentiate these subjects and to make specific provision for some instruction in them. Thus, for example, Ontario Agricultural College has a half-course in each of the five. Where the colleges were established as faculties of the university, there are fewer half-courses and the actual content which could be said to come under the satellite subjects is more difficult to determine. It is safe to say that students graduating in agricultural economics will have had some farm accounting and farm records, some farm management, and some instruction in co-operation either in a separate course or in the course in marketing. Manitoba and Alberta do not require statistics. Ontario and Manitoba require courses in rural social programs or rural sociology. In its economics option, Saskatchewan requires a course in political science. The differences between institutions can be attributed largely to historical factors (as suggested above) or departmental organization (e.g., in Saskatchewan political science is taught in the Department of Economics), although the persistence of program differences may reflect differences in philosophy.

No useful generalization appears possible regarding the course requirements in economics. The real difference in emphasis and content is not as great as a listing of titles of courses would suggest. All programs provide for some additional theory (whether in a separate course or in the development of other courses), some analysis of the movement of farm prices and discussion of price policies, and some finance (public finance or money and banking). The total time allotted to economics and related subjects varies. In Alberta the student who has completed the requirements for the degree of B.Sc. in Agriculture and who has followed the agricultural economics program will have had a principles course (in the junior year); full courses in accounting and farm management; and a minimum of two and maximum of four full courses in economics. The required courses are "Economics of Agriculture" and "Agricultural Marketing"; "Canadian Economic Problems" and "Public Finance" are recommended as electives. In Manitoba the graduate may have had a principles course; half-courses in farm management, co-operative organization, and rural sociology, and a full-course in advanced farm management; half-courses in intermediate economic analysis, marketing, land economics and appraisal, agricultural price policy, economic programs in agriculture, as well as full courses in agricultural price analysis and money and banking. The range of courses which may be offered the undergraduates in agriculture is well enough illustrated by the Manitoba list.

*Graduate Programs.* Each of the colleges offers arrangements whereby students specializing in agricultural economics may proceed to a master's degree—in some cases an M.Sc. but more frequently an M.A.

Graduate programs come under the school of graduate studies and are subject to uniform university regulations. Generally: second-class standing in the undergraduate studies is required and this standing must be maintained throughout the graduate work; the minimum time required is one year, although the majority of students, having a pass degree, are required to take two years; the student must submit a thesis. The common practice is to include a preponderance of courses in general economics in the master's program and the agricultural graduate who acquires an M.A. will in most cases have had as much formal instruction in economics as the arts student with an honors baccalaureate degree. Few doctorates are awarded at Canadian universities, other than McGill and Toronto, and I do not know of any graduate in agriculture who has completed a doctoral program in economics in Canada.

*Combined Degrees.* Canadian universities frequently offer combined courses. Usually these courses effect a combination between the requirements for the degree of bachelor of arts and the professional degree so that the two degrees may be obtained in less than the full time to secure the degrees separately. Both Saskatchewan and British Columbia offer combined courses in arts and agriculture; and the former combines two professional degrees in agriculture and commerce. Alberta at one time provided the arts and agriculture program but, due to infrequent registrations, the privilege was withdrawn. In principle, the combined course in arts and agriculture should prove attractive to students entering a university with an interest in agricultural economics. In practice few students elect to proceed by this route.

## II. *Gains From Associations With a University*

The western institutions, more recently established, have incorporated the college of agriculture into the framework of the provincial university. Although the broad educational deficiencies of a detached college can be reduced, if not wholly offset, by generous financial support, by staff adequate in numbers and qualifications, and by a deliberate effort to create and foster the atmosphere of the larger and more diversified institution, nevertheless, it is our conviction that the balance of advantage in terms of educational achievement must be with the college of agriculture which is an integral part of a university. If agricultural education is vocational training, the advantage probably lies with the separate institution which can develop a more intensive application to the specific problems of agriculture. In the university, the student lives and works in the atmosphere of the *studium generale* and has at least a larger opportunity to brush intellects with students and staff having other interests. He may acquire an awareness of the

relevance of many areas of knowledge. He is likely, however unconsciously, to emerge with a wider appreciation of the complex roots of human behavior and with a livelier sense of the significance of alternatives. This should be especially valuable to the student who is interested in economics. The diversified institution appears preferable because, in that environment, he unconsciously and perhaps against his basic interest on admission, absorbs something which contributes to his education.

*Exploiting the Conscious Interest of the Student.* In the diversified institution, students in the college of agriculture may receive their instruction in the basic sciences, English, and economics in classes which include students from other faculties. This has both advantages and disadvantages, and in most cases legitimate administrative considerations will enter into the decision. Perhaps the primary educational consideration is the exploitation of the conscious interests of the student. The college of agriculture is a professional school which confers a science degree. The typical student entering the faculty has a strong bias toward the technical studies and toward the specific agricultural problems with which he is familiar. This is too narrow a foundation for a sound education, and the atmosphere of the institution should serve to provide the student with a broader basis. In the matter of classroom instruction, however, the interest of the student is a potent factor in the learning process. The "narrow" interest of the agricultural student has led him to select a particular profession. He is in a hurry to get into those courses which seem to have purpose to him. The basic sciences merely consume his time. The humanities and social studies he will suffer only if they are required and if he can sense their relation to real problems of which his experience has made him aware. This attitude cannot be ignored; it must not be deliberately opposed; it can be exploited. The instructor who is required to meet a mixed class of students drawn from several faculties must inevitably find difficulty in making the subject equally significant to all. When the students in agriculture are taught in a separate group, the instructor is in a position to adapt his material and approach so as to establish in the minds of the students the relevance of the relations with which the course is concerned. The basic content of the course may not, and need not, vary greatly from the course offered to students in other faculties. It need not be less rigorous or more narrowly specialized. The problem is not so much one of content as of a meeting of minds between teacher and student.

*Economics in an Applied Science Curriculum.* The degree conferred on graduands of the agricultural colleges in Canada is a science degree. The graduate of the university conferring the degree carries with him

the distinguishing mark of one who has been exposed to scientific disciplines. The course of studies must therefore be devised with the object of assuring a substantial measure of competence in agricultural science. Suppose that we were to attempt to formulate, *de novo* and without reference to existing facilities, curricula designed to prepare persons for the following vocations: scientific enquiries in the laboratory of a flour-milling organization; agricultural advisory services or, more specifically, the work of the district agriculturist; and advising on policies of agricultural price stabilization. A common relation to agriculture might be regarded as significant; but a common basis of agricultural science and technology would not seem to be required. However, it is impossible to proceed *de novo*, and economical behavior demands that consideration be given to facilities in use for other purposes. It is realistic to recognize that the agricultural college is organized primarily to educate agricultural scientists and that undergraduate programs within the college for prospective agricultural extension workers and agricultural economists must be arrived at by modification of, and adaptation to, a science curriculum.

In the Canadian colleges a course in economics is required in the two common years. For many students this is all the formal instruction in economics they will get. Is this worth while? The question is part of the larger one of the place of courses dealing with the behavior of people, and of economics in particular, in any professional, technical, and scientific university program. The fact that the curriculum of the medical college does not include economics might be insufficient to justify its absence from the curriculum of the college of agriculture; but sound arguments for the inclusion of economics in the agricultural curriculum should apply with equal validity to medicine or engineering. It could hardly be demonstrated that with four years prescribed for agriculture, four years for engineering, and six years for medicine, the content of agricultural science is such as to leave more room for the inclusion of courses related to people than is possible in engineering or medicine.

However, the organization and content of a course based upon the standard text in principles of economics does not meet the requirements of those students whose formal instruction in the discipline will go no further. The student who is subjected to a single course in economics cannot be expected to absorb a complete system of economic thought. The approach must be entirely different from that of the introductory course which is prerequisite to further studies and which is designed primarily to develop the student's facility in the use of analytical tools. It should aim at certain limited and well-defined objectives with which formal instruction in economics is properly and



exclusively concerned. The primary objective is to develop in the student the habit of looking at social action in a particular way.

For the student of technology, no accomplishment is so important to his education as an awareness of the significance of expressed human objectives and the relevance of alternatives to the concept and achievement of the optimum use of resources. This should be drilled into him so that it becomes impossible for him at any time to define the use of land in terms of nature's intentions or to advocate investment in irrigation works without giving thought to alternative investment opportunities. While exploiting the student's special interests, he should be required to survey the functioning of the whole economy so that he may acquire a sense of the interdependence of parts and a capacity for detecting in his own thinking those errors of judgment which arise from agrocentricity. Finally, he should be given a convincing demonstration of the manner in which particular economic problems familiar to him can be elucidated by the application of disciplined thinking; thereby encouraging in him a regard for intellectual integrity in his own approach to practical problems.

*Farm Management and the General Options.* I have already made clear my view that the degree in agricultural science should not be too greatly diluted in its science content by the inclusion of economics. Four years is not too long to develop a competence in agricultural science; and the attempt in the same period of time to combine both agricultural science and economics in any balanced proportion is doomed to failure. However, it is in this connection that the distinction between economics and farm management becomes especially significant. Much is to be gained by a clearer distinction between these two disciplines. Farm management (or, if you like, private economics) has to do with decisions falling within the competence of the individual farmer; with factors which within the limits of knowledge are susceptible to control by the farmer; or with factors which, being external to the farm, must be taken as given data in the solution of the problems of farm management. Technical considerations must necessarily occupy a substantial place in the discipline of farm management; and the problems of farm management cannot be intelligently approached without a substantial competence in agricultural science. It can also be said that the agricultural scientist, if he is to be able to see his technical knowledge in the context of the real situation and to interpret his discoveries in terms of practical application, should be formally introduced to the discipline of farm management. By reason of the necessarily intimate relation between farm management and agricultural science, it is possible and desirable to include in the B.Sc. curriculum more of the former, than is the case with economics, with-



out destroying the integrity of the science degree. It is, in my opinion, possible to incorporate within the general option sufficient instruction in farm management to develop a satisfying competence in this discipline.

*Education of the Agricultural Economist.* The student entering the course of studies leading to a degree in agricultural science should at the end of two years common to all students have a choice between one of a number of science options, a general option, with a concentration in farm management, and a general option, including only sufficient economics to permit him to proceed to graduate studies. The choice should be made on the basis of the student's interests and intentions. The student who elects the general option with economics is electing the vocation of the agricultural economist.

Within the undergraduate program, the minimum of four courses required at the University of Alberta seems to me to be adequate. If the students' timetables permit and provided it can be done without eliminating courses in the major agricultural departments of soils, animal science, and plant science, they may elect additional courses in the Department of Political Economy. Our requirements include "Principles of Economics," "Farm Management," "Economics of Agriculture," and "Agricultural Marketing"—all offered under the Department of Political Economy. I would not insist on these particular courses if, with larger numbers of students, we were in a position to offer a wider range of courses in economics for students in agriculture. What is required is that before proceeding to their graduate studies in economics, these students should have acquired an appreciation of the significance of economic analysis and an adequate capacity to make use of its essential tools.

The student embarking on the general option with economics should be carefully guided away from the illusion that on graduating with the bachelor of science degree he has any qualifications to consider himself an agricultural economist; nor should he be impatient with the foundations in economics being laid in the undergraduate program. He should be led to understand that, having chosen to combine economics with agricultural science, the two years of graduate studies in economics are an essential part of his complete program. In other words, at the end of the two common years he is making the decision to complete a six-year program leading to the B.Sc. and M.A. At the completion of this full course of studies he will have attained a sufficient competence in the technology of agriculture and in economics to enable him to approach with some confidence a wide range of agricultural problems.

Experience suggests that graduates in agricultural science who become agricultural economists fail to maintain or expand their technical

knowledge unless, and then only as far as, the particular problems with which they are concerned require them to do so. The agricultural economist who must work on a variety of problems is likely soon to recognize serious limitations in his capacity to deal with the technical aspects. In the type of problem in which technical factors bulk large, he will wish to consult or co-operate with those having greater competence.

The student entering university with an interest in the economic and social rather than in the technical aspects of agriculture might be directed to register into the faculty of arts and science in a program with concentration in economics. If after three years leading to the baccalaureate degree he completes a master's degree in economics, he has in one year less than the student who has the science degree in agriculture advanced slightly further in his formal training in economics—and probably significantly further in his understanding of human behavior. He may encounter some difficulty in his courses in agricultural economics, but if he is of farm origin, these difficulties are not likely to be serious at the level at which the technical considerations are handled by the agricultural economist who is instructing him. Assuming a familiarity with the thinking and behavior of rural people, he is undoubtedly capable of approaching with understanding many problems affecting agriculture. In certain areas his dependence upon and need for co-operation with workers with technical competence is greater than in the case of the graduate in agricultural science.

I have suggested there is a tendency for the agricultural economist who has come through scientific agriculture to terminate his growth as an agricultural scientist on graduation. His postgraduate studies are pursued almost exclusively in economics. This seems to be the general Canadian experience. However, it seems to me that the procedure should depend on personal inclinations and preferences. There are places in the field of agricultural economics for persons with varied training and experience. It would be a mistake to endeavor to prescribe a single program of studies for those who plan to enter the field or to accept as applicants for admission to positions as agricultural economists only those who have followed a particular pattern of formal preparation.

## TEACHING ECONOMICS IN AGRICULTURAL COLLEGES IN THE UNITED STATES

By T. K. COWDEN  
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I approach this topic of "Teaching Economics in Agricultural Colleges" with much humility. We have very little factual information concerning what constitutes a good education for the thousands of students entrusted to our care. Most of us probably have done more research on factors affecting the price of hogs or some similar problem than we have on what constitutes a good training.

This paper is based upon the following premises:

1. Land-grant colleges are dedicated to mass education: not the training of a select few but to the training of a substantial number of the youth of the nation. In addition, it is the responsibility of the land-grant colleges to carry on a program of off-campus education in agriculture.

2. A broad fundamental training is desirable for the majority of students in agricultural colleges rather than a highly specialized training within the field of agriculture. Most employers are concerned that students have certain basic traits rather than a particular major. Likewise, students frequently do not know what they want to do. The concept of a broad training varies: to some a broad training in agriculture consists of students taking at least one course in each department of the college of agriculture, which in many cases is overdepartmentalized. This is not my concept of a broad fundamental training program in agriculture. In some cases a broad fundamental training calls for less emphasis on agricultural courses and more emphasis on cultural development, on ability to think and express oneself, and an understanding of basic principles. It is not enough to train students how to make a living, but also we must train them in how to live and how to meet the responsibilities of citizenship.

3. The scarce factor in training students is time. Some may say brains; but for the purpose of this discussion I will deal with the time factor. We could give students much more training in the hundreds of different fields if we could keep them long enough. Our immediate problem is how to make the best use of the time that they spend on our campuses. This includes the students who drop out before completing their four-year course. The study of economics must compete with many other important areas for the student's time. It is our job, there-

fore, to see that the student's time is used efficiently in providing the best possible start on an education. The real education will have to come after the students leave our campuses. If we have not planted the seeds for a self-propelled education, then we have failed in our purposes.

4. It is not the job of the economist to get the most economics possible into the curriculum, but to work toward the best possible education of the student. Where economics fits into the program is secondary to this over-all goal. There may be more than one way to achieve a good education. There may not be agreement on the best method, but likely there will be agreement that improvements can be made.

5. It is the major responsibility of the departments of economics and agricultural economics to give all students in agricultural colleges some training in economics rather than to train a few specialists in the field. It is of special importance to see that some understanding of economics is obtained by students who will later become teachers, such as county agricultural agents and vocational agricultural teachers.

Since the land-grant colleges are responsible for the greater part of the instruction in agriculture at the collegiate level, it is important that we understand the organization of these institutions. Organization affects very materially both the potentialities and the limitations of what can be done in teaching economics. We can set up goals but these goals must be adjusted to fit into the instructional framework. Some land-grant colleges are parts of great universities on whose campuses a wide variety of courses are being taught. Others are primarily agricultural and engineering schools. The land-grant colleges by statute are dedicated to serving the people in their respective states.

Most agricultural colleges consist of three co-ordinated phases of work: resident teaching; extension (that is, off-campus teaching); and research. Extension is a form of teaching which will not be dealt with in detail in this paper; yet it cannot be ignored, for it should influence very materially our teaching of economics in agricultural colleges. There is no other branch of education that has an off-campus teaching force anywhere near approaching that in the field of agriculture. The potential of economic education through agricultural extension is tremendous.

There is a lot of lip service given to the importance of economics and other social sciences in collegiate training today. Administrators and others talk about the importance of a broad training but find it very difficult to do anything about it. The rigidity of institutional organization is an important factor. I am inclined to feel, however, that much of the fault lies not with the administrators but with the failure of the people in the social sciences to offer satisfactory courses.

*Data from College Catalogues<sup>1</sup>*

In 1951 there were over 33,000 students in schools or colleges of agriculture in the forty-eight major land-grant institutions. The number of students taking agriculture in an institution ranged from 65 to over 1,700. About one third of the institutions had between 250 and 500 agricultural students; another third had between 500 and 750 students in agriculture. These figures do not include students studying agriculture in other institutions of higher learning.

To get a picture of the courses offered in economics and agricultural economics, the college catalogues of most of the major land-grant colleges were analyzed. Anyone who has ever tried this sort of analysis will be fully aware of the limitations of the procedure. It is very difficult, if not impossible, to be sure that the proper interpretation is made of the material presented in the catalogues. Likewise, there is no way of knowing from the catalogues what courses are elected by students in the various subjects. Nevertheless, some over-all approximations can be made.

According to the analysis, the average agricultural school had eleven departments and offered an average of eighteen options to the agricultural students. Now in order to be realistic it must be recognized that each of these departments is interested in getting students to major with them and in building up their department. To each, their respective field is very important, and rightly so. The dean, in his position as a compromiser, usually finds it expedient to divide required work somewhat equally among the departments. Beyond that the students are permitted to select a major in a given department. And from that point the requirements of the option are dictated largely by the major department and in many cases little time is left for electives. Anyone attempting to emphasize a broad or a flexible training program is naïve if he overlooks this fact. Major changes in curriculum require strong and aggressive top administration.

It must be remembered that economics is not the only field that has become more complex. In each field there is an increasing amount of knowledge that the well-trained student should know. Take horticulture, for example. It is not merely a question of a student knowing varieties, when to spray, and how to prune but there is involved an understanding of soils, genetics, botany, plant diseases, entomology, growth regulators, chemistry, and many other complicated fields.

Of 558 options analyzed, it was estimated that about 50 per cent required no agricultural economics, about 61 per cent required no

<sup>1</sup> The statistical data in this section of the paper were tabulated by Carl J. Arnold, a graduate student at Michigan State College.



economics, and in the neighborhood of 25 per cent required neither. The above applies only to required courses as shown in the catalogues. They do not include elective courses which may be taken by the students.

The larger schools had more departments and tended to offer more options in which a student could major. The more options offered, the greater was the tendency for a higher proportion of these options to require no economics. It should be realized that many of these options were highly technical and had comparatively few students. The options in which there are sizable enrollment, such as animal husbandry and horticulture, usually require some economics in their program. About seven-eighths of the animal husbandry options and about three-fourths of the horticultural options required economics or agricultural economics.

The average land-grant institution required 134 semester hours for graduation. From an examination of the catalogues it appears that an average of about 10 semester hours in agricultural economics was required by those options which required any agricultural economics at all. This would be about 8 per cent of the total requirements of those options for graduation. In addition, those options that required any economics required an average of about 4 semester hours, or about 3 per cent of the total requirement of the options. Again, one should be reminded that conclusions from this type of catalogue analysis are hazardous and subject to many misinterpretations.

A rough estimate would indicate that the average student in land-grant colleges of agriculture is required to take between two and three courses, amounting to from 6 to 9 semester hours, in economics or agricultural economics.

The average institution, if there be such, offered 14 courses for a total of 46 semester credit hours in agricultural economics, and 27 courses for a total of 84 semester credit hours in economics. The number of different courses offered in agricultural economics ranged from 6 to 33; in economics from 10 to 71. There appears to be no shortage in the number of courses offered in economics or agricultural economics. It would take a student carrying a normal load 204 academic years to take all of the courses offered at Michigan State College. It would take him over 5 academic years just to take the courses offered in economics and agricultural economics. The question might well be raised: Are there too many courses offered and could a better teaching job be done by concentrating our efforts on fewer and better courses? I believe that fewer and better courses are desirable.

*Undergraduate Teaching*

Much work needs to be done in organizing the over-all curriculum offered agricultural students. This is a complicated and courageous undertaking. Less involved and perhaps equally productive is work on course content and good teaching methods, so that agricultural students may receive the best possible training in economics for the time allotted to the subject.

All agricultural students should have at least three courses in economics. Close co-operation between the economics and the agricultural economics departments is essential for an effective program.

Just downright poor teaching plagues not only the social sciences but all collegiate instruction. In my judgment, much more teaching progress has been made in the elementary schools than in the colleges.

A required course in general principles of economics, in my judgment, should be taught to agricultural students by the economics department or by well-qualified persons in a basic college. This beginning course is extremely important; it is here that the student gets his first exposure to the subject. Poor teaching in the beginning course in economics has driven many students away from the field. Too often the courses are dry and fail to make application to real life. On the other hand, there are cases where professors have turned a beginning course into a course in current problems in an attempt to make it popular and have failed to teach economic principles. A good understanding of principles is essential to later work. In this course an attempt also should be made to tie economics in with the other social sciences. A real challenge exists for the very best skilled instructor to teach these beginning courses.

I also feel that some professors of economics have spent so much time talking about what's wrong with our economic system that they have failed to impart to our students its strong points and its accomplishments. This, in my judgment, is an unforgivable omission.

Following the course in principles, the agricultural students should have a course in production economics and farm organization early in their college career. Major emphasis in this course should be placed upon operation of the individual farm firm. This course should be so good that the students will continue to apply it as they take courses in the production departments. It should so impress a few fundamentals on the student's mind that if he later becomes a county agent, a teacher, or a farmer, he will evaluate proposed programs in terms of how they fit into going concerns; for example, soil conservation programs and 4-H Club livestock projects.

The great stress upon farm organization may not fit into an ideal pat-

tern of training, but I am convinced that it is the most needed phase of economic instruction in view of the other training agricultural students receive. The reason it is so important is that the agricultural student receives much of his training in production techniques, and training in production economics will make this training more meaningful and useful. The marginal return of production economics per unit of input applied to the training of most agricultural students will, in my judgment, be higher than other types of economic instruction. The above statements are made in terms of actualities, not necessarily in terms of the ideal.

The third course in economics for undergraduate agricultural students should be a general course in agricultural economics, in which emphasis should be placed upon the broader phases of economics as applied to agriculture. Here emphasis should be placed upon where agriculture fits into the national and international economy, a few of the fundamentals pertaining to agricultural prices, marketing, and the like.

Beyond these three basic courses—which are about all most agricultural students will take—courses should be made available in prices, advanced farm organization and management, marketing, and a broad course in public problems affecting agriculture.

Now let us consider in more detail the content of the material to be offered in the three beginning courses. What the courses are called, their number, or where they are taught is immaterial. Let us consider them not for economic majors but for most of the 33,000 students enrolled in our agricultural colleges. This material must be taught in such a manner as to compete for the students' interest. No material can be forced upon an unwilling student body if the maximum results are to be obtained.

I do not expect agreement in what should be offered. I asked ten of my colleagues to list what they thought should be taught in a beginning course in economics for agricultural students and also in a beginning course in agricultural economics. The replies were so divergent that it would be very difficult to prepare a summary.

It seems to me that somewhere in the course of training, all agricultural students should be exposed to the following:

1. The application of basic economic principles, such as comparative advantage, diminishing returns and utility, marginal analysis, and the elasticity of supply and demand.
2. The function of prices in our economy and how prices are established.
3. Organization of production, especially the individual firm.

4. Training in analyzing and planning the organization of farm production, including such things as size of business, combination of enterprises, use of credit, and the like.

5. General information on the operation of the marketing system.

6. Training in analysis of problems in personal, household, and consumption economics, especially from the standpoint of the family as a spending unit.<sup>2</sup>

7. The place of agriculture in our economy; that is, the proportion of labor force employed in agriculture, the percentage of income received, and the like.

8. Basic economic trends affecting agriculture and the impact of changes in such items as consumer incomes and price levels upon the agricultural economy.

9. The importance of technological changes and increased productivity to standards of living, including the role of colleges in this process.

10. The type of economic systems used in various nations.

11. The principles of international trade.

12. A few of the major public policy issues facing agriculture and the nation, such as over-all price stability, high levels of employment, soil conservation, land use problems, and farm price support programs.

13. The responsibility of the citizen in understanding and contributing to the solution of public issues facing the community, the nation, and society as a whole.

A complete understanding of all subject matter by all students is unlikely, but progress toward such understanding is certainly a responsibility of our educational system. We are inclined to expect too much from students. If students had a complete understanding of the material proposed in some of the outlines I have seen of what should be taught to undergraduates, they would know more than most of our graduate students and perhaps even more than the professors.

We should not lose sight of the fact that one of our big jobs is to teach students to think, to reason, and to analyze rather than to acquire a lot of facts and figures that are likely to become out of date. There may be more than one way to do this. Although there is currently much criticism of the emphasis placed on livestock judging in certain phases of agricultural training, I have often wondered if as a teaching technique it is not of considerable value. Judging trains the student to observe, to analyze, to decide, to act on a decision, and to assume responsibility for the decision. These are desirable traits in most any area of endeavor.

<sup>2</sup> I was particularly impressed by Dr. J. D. Black's emphasis on this phase of economics in his recent article in the August, 1952, issue of the *Journal of Farm Economics*.

We must start with the students and the institutions as they are, not as we would like to have them. Most agricultural students understand what is meant by poultry, dairying, or farm crops, but many have no idea of the content of economic courses. In some institutions it may be desirable to give joint courses with other departments. At our institution we are offering a course in poultry marketing to be taught jointly by the departments of poultry and agricultural economics. If this works out, similar courses will be offered in other fields. This could contribute to better interdepartmental co-operation and could result in more students being exposed to additional economics.

I am not enthusiastic about undergraduate majors in the field of agricultural economics; however, majors are probably a necessity in view of the organization of agricultural colleges. I would prefer that all undergraduate students in agriculture receive: a good basic training clear across the board, including such subjects as English, history, basic science, etc., preferably in a basic college; basic training in agriculture, including genetics, nutrition, botany, zoology, feeds and feeding, and soils; and a reasonable number of applied courses in animal science, plant science, and the social sciences. The agricultural economics options, in my opinion, should go as far in this direction as possible. The exact nature of their requirements will depend upon the setup and requirements of the institution in other fields. Therefore no rigid set of requirements can be established that will fit all institutions.

Agricultural economics majors should receive, in addition to a fundamental training in agriculture and the three economic courses proposed for all students, a course in marketing, a course in prices, a course in advanced farm management, and a course in agricultural policy. Outside the department, they should be encouraged to take additional courses in production fields and some courses in economics, political science, sociology, and, in some cases, accounting. There should be as many elective courses as possible and close contact should be maintained between the student and his departmental advisor.

*Short Courses.* Many agricultural colleges offer a series of on-campus short courses ranging from two weeks to several months' duration. Most of these courses are at the subcollege level and are designed for farm youth who do not feel justified in spending, or cannot spend, four years on the campus. A high proportion of these youths return to the farms and become leaders in their local communities. Economic training for these students is very important. They will probably not be exposed to a course in principles of economics. Farm management training is highly important; also a course in general agricultural economics is desirable. In these courses a problem approach should be used, starting with the problem and applying the economic principles.



*Graduate Training.* Even in graduate training, time is the limiting factor. There is apparently no limit upon what we would like our graduate students to know.

In this area agricultural schools have the opportunity to switch from a mass education basis to one of highly personalized and individualized instruction, especially at the Ph.D. level. In some respects, due to the size of their staffs in agricultural economics, they can make graduate training more personalized than in non-land-grant colleges.

The professional agricultural economist should, first of all, be an economist who knows agriculture. This requires a good training in economic theory. He should have a background in statistics and mathematics; yet he should never forget that he is dealing with human beings who frequently fail to react according to any set formula. Given these tools, he is then ready for, shall we say, applied courses in agricultural economics. Here it is my feeling that these courses should be so selected that they cover the field rather than give a narrow specialization. The thesis should be used to place emphasis upon research procedures and specialization within a field. About one-third of the student's time should be on theory and mathematics or some related discipline, one-third on applied courses, and one-third on research.

The Ph.D. candidate should take minors outside the department. Here an operating problem arises in that quite often the minor departments expect the student to have an equivalent of a major with them. I feel there is a need, especially in our larger graduate schools, for departments to offer rather broad special courses at the graduate level for nonmajors. This would permit graduate students to obtain a general knowledge of more related areas. A broad course in agricultural economics might well be offered for graduate students in the agricultural colleges who are majoring in other fields. The same degree of perfection should not be expected from these students as from our own majors.

It is my conviction that the foreign language requirements do not make the best use of an agricultural economics graduate student's time. He could much more profitably spend his time acquiring skills in needed tools in other disciplines.

Another problem in graduate training in economics is advanced on-the-job training for the many professional workers in the field of agriculture, such as county agents and vocational agriculture teachers. Considerable emphasis is being placed upon advanced training for this type of personnel. If departments of agricultural economics concentrate only on training professional economists at the graduate level, they will find that the personnel they have to work with in the field will receive advanced training in other areas.

Consideration should be given to offering a master's degree in agricultural economics as part of on-the-job training. One of the primary prerequisites could be successful performance in the field of the candidate's employment rather than undergraduate grades or courses taken as an undergraduate student. The courses taken should be designed for people returning to their previous field of work rather than training professional agricultural economists. If they should desire to take additional graduate work beyond the master's level, their credits could be reappraised in the light of requirements for a professional degree. College graduates with no work experience would be expected to meet the qualifications for the professional degree. It is realized that such a procedure will create some problems, but in a land-grant agricultural school dedicated to mass education, off the campus as well as on, it is highly important to have a field staff possessing some acquaintance with economics.

*Extension.* One of the distinguishing features of agricultural colleges is their extension service for off-campus education in the field of agriculture and home economics. We have had too many practitioners and not enough teachers in extension. A teacher of economics in extension must be well trained. I have observed that a well-trained extension worker can effectively handle such controversial topics as tariffs with farmer audiences, while the untrained worker will fail on such assignments.

The extension teacher must be able to cut through to the fundamental issues and give the people established principles from which to reason. He cannot confuse people with details. He does not have a captive audience nor can he assign a book of readings. He must do his teaching by means of a problem approach. However, principles established and agreed upon first, often help in a sounder approach; for example, if the role of tax policy in price stability is established, it may aid in dealing with current taxation problems.

More real teaching skill is required for a good extension teacher than for an instructor of graduate students. The extension personnel may not need to be as smart in some ways but must be much more skillful in others. Teaching economics in agricultural colleges cannot be divorced from our extension responsibilities. Our training should include presentation of material as well as subject matter.

*Research.* Research will not be discussed, except to mention that very few departments have at their disposal the financial means for carrying on research as have the agricultural economics departments of land-grant colleges. These financial resources bring responsibilities and opportunities, many of which have not been fully utilized.

A good research program makes for better results from teaching.

Joint research between the economist and the production specialist offers a promising avenue to getting more economics into the teaching of other departments in schools of agriculture.

*Suggestions.* In conclusion I have two proposals to make. These are based upon the belief that one of the functions of the economist is to serve as a synthesizer and co-ordinator of information in an attempt to bring it into meaningful focus.

The first is that the Association of Land-Grant Colleges and Universities establish a committee with the funds for research at its disposal to review the over-all courses of instruction offered in agricultural colleges and make broad recommendations for improvements. The committee, among other things, should determine what graduates of agricultural colleges are doing in relation to their undergraduate majors. The committee should analyze means of saving the students' time in acquiring the basic knowledge and skills essential to the various phases of agricultural training. For example, it might be found that considerable student time could be saved if students were to take basic courses in animal science rather than a series of courses in poultry, dairying, hogs, cattle, and sheep. Likewise, the possibilities and limitations of a core of basic courses in plant science and the social sciences should be investigated. Course content as well as the alignment of courses will need to be scrutinized.

The above should be done on a research basis, not as a reform measure. It is not an established fact that another method would be better: it is a hypothesis worthy of further study. Certainly with the millions of dollars now being spent on agricultural research, a little expenditure on student training should be justified. If the analysis indicated that improvement in student training could be made by such steps, there might be a few administrators with enough courage to attempt some major changes. It would be far from easy to make these changes.

The second proposal is one about which something could be done without involving institutional reorganization. It is proposed that a joint committee be created between the American Economic Association and the American Farm Economic Association for the purpose of developing a sequence of basic material in economics to which all agricultural students should be exposed during their college training. This proposed committee could build upon the work done by the previous teaching committees, especially the material published in the 1950 supplement.<sup>3</sup> The new committee should be further charged with the responsibility of keeping its recommendations realistic in terms of what

<sup>3</sup>*Teaching of Undergraduate Economics* (Report of the Committee on Undergraduate Teaching of Economics and the Training of Economists), *American Economic Review*, December Supplement, 1950.

can be accomplished within the present institutional framework. The committee should recognize that our first responsibility is to use effectively the student's time that is now allocated to economics. It appears that most of the colleges of agriculture require from two to three courses for a total of six to nine semester credits in economics or agricultural economics. It is highly important that such a committee keep in mind that this material is for the 33,000 agricultural students and not for economics majors. It should not consider only what we would like the students to know about economics but also what we can get across to the student in the time allocated to the subject, using the best-known teaching methods and techniques. Such information could then be used by the various economics departments in different institutions to make sure that the students receive the best economic training in the allotted time. What the courses are called or by whom presented is secondary and could be determined within the respective institutions.

## DISCUSSION

**D. GALE JOHNSON:** The two speakers have provided us with excellent surveys and analyses of the various curricula in agricultural economics in Canada and the United States. I have only three comments to make concerning President Stewart's paper.

My first comment is designed solely to add emphasis to an important point made by him and this I shall do by quoting the following sentence: "For the student of technology no accomplishment is so important to his education as an awareness of the significance of expressed human objectives and the relevance of alternatives to the concept and achievement of optimum resource use." One of our main failings in teaching economics to students of agriculture who do not intend to specialize in agricultural economics is that no clear concept of the general significance of the main body of economics is specified and made understandable to such students. Economics is essentially a study of alternatives; economics provides a system of thought within which alternative actions may be compared and appraised. This is, I believe, the unique contribution that economics can make in the education of the student who does not plan to major in economics.

My second comment relates to President Stewart's preference for the incorporation of the agricultural college within a university rather than the creation of a separate institution. Where the combined institutions do not become giants, such as some of our state universities, I believe that this principle is sound. But two kinds of exceptions may be noted. In the United States it has been true in too many instances that the development of the agricultural college in connection with a university has not resulted in any significant degree of integration or interchange of ideas between the various faculties or between various student groups. It has also been true that some of the outstanding departments of agricultural economics in the United States have been in state colleges. This is now true of the outstanding departments at Michigan State College and at North Carolina State College and an unbiased observer would still rate the Iowa State College department at or near the top of the agricultural economics departments.

My third comment must take the form of a dissent. I do not believe that it is wise to try to separate farm management and economics as disciplines. Wherever this has been done in the United States, work in both areas has suffered. Because of its practical importance farm management has emerged supreme and economics has been neglected. And the farm management work has suffered because it has not been based upon a sound foundation in economics. It is no accident, I believe, that the best work in farm management is now being done by men who consider farm management as only one aspect of economics.

One of the most important defects in the training of agricultural economists is due to the limitations of the education provided in the first two years' program in most of our agricultural colleges. A very large fraction of the courses



directly related to agriculture are applied courses of the "cookbook" type. In order that these so-called "practical courses" may be included, the basic sciences, mathematics, and statistics are either partially or wholly excluded from the curricula. If applied courses are to be taught in colleges, they should come after the student has some familiarity with chemistry, physics, genetics, physiology, biology, and any other fields that may contribute to an understanding of agricultural production processes.

Departments of agricultural economics are subject to much the same criticism. Descriptive courses in marketing, farm credit, farm finance, co-operatives, farm management, and applied courses such as farm accounting precede training in economic analysis. Most such courses can be of lasting value only if they follow a reasonably adequate introduction to and understanding of economic analysis.

FREDERICK V. WAUGH: Although I am not a professional teacher, both papers seem to me stimulating and important. A competent agricultural economist must have a good basic education both in agricultural science and in economics. And he must be able to apply economic principles to concrete problems relative to farm production and to the marketing of farm products.

Both Professor Cowden and President Stewart emphasize the importance of a good grounding in economic theory. But, as President Stewart says, the agricultural student "will suffer social studies only if . . . he can sense their relation to real problems." In my opinion, this is an extremely important point. A student has a right to expect that economic theory will be of some practical use to him: perhaps helping him to earn a living or to be a more intelligent voter, bureaucrat, or politician. He is not satisfied (nor should he be satisfied) with a lot of abstract principles, definitions, and phrases.

But, as Professor Cowden says, "too often the courses are dry and fail to make application to real life." This is a serious fault, and one which can be corrected. I heartily second President Stewart's statement that the student "should be given a convincing demonstration of the manner in which particular economic problems, familiar to him, can be elucidated by the application of disciplined thinking." Unless the teacher can make such a demonstration he has failed to teach economics.

President Stewart recommends four required courses for undergraduates majoring in agricultural economics. These courses are principles, farm management, economics of agriculture, and marketing. I think it would be wise to require elementary statistics also. Agreeing wholeheartedly with President Stewart's emphasis upon the need for convincing demonstrations of applications of theory to real problems, I believe that the undergraduate needs enough understanding of statistics to recognize a valid demonstration when he sees it. And I doubt if a student can learn to analyze problems in farm management and marketing unless he learns how to use statistics.

SOCIOLOGY AND ECONOMIC SCIENCE  
SOCIOLOGICAL VALUE THEORY, ECONOMIC ANALYSES,  
AND ECONOMIC POLICY

By JOSEPH J. SPENGLER  
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"The higher the human intellect rises in the  
discovery of . . . aims, the more obvious it be-  
comes that the final aim is beyond its reach."  
Leo Tolstoy, in *War and Peace*

In this paper I touch upon five questions: (1) Why do economists trouble themselves about behavior determinants which are "noneconomic" in character or which lie outside the economist's usual model or framework of reference? (2) What is meant by values, value orientations, and value systems, as those terms are presently employed? (3) Are values measurable in a sense similar to that in which Marshall believed the motives dominating business life to be measurable? (4) In what manner is the behavior which economists study affected by values and value changes? (5) In what respects if any may the findings of sociologists and anthropologists respecting values and value orientations prove of use to economists?

I

Economists have troubled themselves about noneconomic determinants of "economic" behavior for two reasons. They have been concerned lest economic behavior be interpreted in a manner incompatible with the findings of behavioral sciences other than economics. Or they have feared that economists may assume too many essentially variable conditioners or determinants of economically significant behavior to be given and invariant.

Representative of the first point of view are certain observations of Thorstein Veblen and those institutionalists who continued in the Veblenian tradition. This view was well put in Veblen's critique of psychological hedonism which purportedly permeated orthodox economists' account of man's economic behavior. Veblen (*The Place of Science in Modern Civilization and Other Essays*, pages 73-75) described the pleasure-and-pain calculating hedonistic man, supposedly postulated in orthodox economics, as:

. . . an isolated, definitive human datum, in stable equilibrium except for the buffets of the impinging forces that displace him in one direction or another. Self-imposed in ele-

mental space, he spins symmetrically about his own spiritual axis until the parallelogram of forces bears down upon him, whereupon he follows the line of the resultant. When the force of the impact is spent, he comes to a rest, a self-contained globule of desire as before. Spiritually, the hedonistic man is not a prime mover.

This conception of human nature was at variance with that revealed by psychological and anthropological research:

It is the characteristic of man to do something, not simply to suffer pleasures and pains through the impact of suitable forces. He is not simply a bundle of desires that are to be satisfied by being placed in the path of the forces of the environment, but rather a coherent structure of propensities and habits which seeks realisation and expression in an unfolding activity. . . . The economic life history of the individual is a cumulative process of adaptation of means to ends that cumulatively change as the process goes on, both the agent and his environment being at any point the outcome of the last process.

Critiques of this sort were, however, discovered to be irrelevant to many, though not to all, of the studies normally undertaken by economists. It was noted that the economist is interested primarily in the functional *how* of a circumscribed portion of man's behavior and not in the psychological and physiological *why* of this behavior. It has been found possible to conceive of worlds in which economic selection takes place even in the absence of behavior describable as economically motivated. (See A. A. Alchian, "Uncertainty, Evolution, and Economic Theory," *Journal of Political Economy*, 1950, pages 211-216.) It has been recognized, moreover, that concern with the why, when not highly constrained, entails a continuing regression of inquiry and, therefore, many of the wastes attendant upon nonspecialization. Indeed, as Samuelson has observed, complete designation of the environment within which relevant functional relationships hold "would require specification of the whole universe." Whence the economist now tends implicitly to assume a matrix of conditions within which to carry out his analysis of given economic problems (P. A. Samuelson, *Foundations of Economic Analysis*, page 7).

For the second view there may be warrant. The response of an economy or of those composing it to specified changes in parameters or to the impact of changes exogenous to the economy as defined is conditioned by noneconomic circumstances. If these circumstances change, therefore, whether autonomously or in consequence of changes that have taken place within the economy proper, functional relationships found within the economy will react accordingly. Whether noneconomic circumstances and changes therein need, however, to be taken into account by the economist turns on the kind of problem confronting him. Sometimes the need exists and sometimes it does not. But when the need does exist, values and value changes may be among the circumstances that require to be allowed for. This, of course, is recognized both by economists who define the scope of economics in terms of the problem under analysis and by those who attach contingent

though varying relevance to noneconomic determinants of economic behavior.

## II

Our discussion of the meaning of values and value systems may be introduced by a question. Suppose that the response of decision-making units, be they uni- or multipersonal in composition, to changes in income and/or the price structure be conditioned by the noneconomic portion of the environment in which these units find themselves. Then, for some, though not for all, purposes of economic analysis, it becomes necessary to take this environment into account. It being impractical for the analyst to conceive of a noneconomic environment in general, he finds it necessary somehow to decompose this environment into component and isolatable elements, to select those of these elements which seemingly condition substitution and income effects significantly, and to ascertain how and in what measure these elements give direction to the relevant behavior paths of the responding decision-making units.

Since interpersonal and intergroup differences in the response of men to changes in income and price structure are not of physiological but of social origin, it is to relevant elements in the macroculture and the microcultures of the community that attention must be directed. Among the most relevant of these elements are man's value orientations—his more or less unconscious assumptions respecting what is desirable—for to these, as Parsons shows, may be traced man's selection of the ends or "anticipated states of affairs" to the achievement of which he directs his efforts.<sup>1</sup>

Both the ends that man pursues and his choice of particular economic, political, or technological means to achieve these ends are conditioned by his value orientations or value attitudes. The ends men pursue are, of course, manifestations of these underlying value orientations. Out of these orientations, furthermore, arise norms, some of which may operate to deter the end-seeking individual from making use of certain means which are technically and otherwise appropriate to the achievement of given desired ends, and others of which may restrict the manner in which he employs the particular means that he selects to accomplish these ends.

While values and value orientations can only be known inferentially from their verbal and other behavioral manifestations and while they have seldom been defined operationally, a number of the generic

<sup>1</sup> This section is based principally upon Talcott Parsons and E. A. Shils, eds., *Toward a General Theory of Action* (Cambridge, 1951), especially pp. 3-27, Part II, and pp. 388-433 (by Clyde Kluckhohn); Parsons, *The Social System* (Glencoe, 1951), *passim*, and *Structure of Social Action* (New York, 1937), especially pages 43-51, 248-249, 260-261, 267-268, 271, 297, 432, 709, 731-733.

characteristics of values and valuing, as these terms are here used, have been identified by the Cornell seminar. Valuing signifies more than mere sensation; it is somewhat conceptual, entailing abstraction from experience, though the conceptual element is not always highly explicit. While values differ in importance, they are, or may be, capable of emotionally mobilizing their possessors, and hence do serve to give direction and organization to action. Values are not identical with needs, since some values involve a variety of needs and some needs may be satisfied in ways compatible with any one of a number of intersubstitutable values. Values which form part of an individual's personality affect his conduct more than do those which have not become internalized. Values tend to get organized into compatible systems at the personal level as well as at the group and cultural levels whence individuals derive most of their values. Again to quote Parsons and Shils:

A value is a *conception*, explicit or implicit, distinctive of an individual or characteristic of a group, of the *desirable* which influences the selection from available modes, means, and ends of action. (Page 395.)

[A value-orientation is] a generalized and organized conception, influencing behavior, of nature, of man's place in it, of man's relation to man, and of the desirable and non-desirable as they relate to man-environment and inter-human relations. Such value-orientations may be held by individuals or, in the abstract-typical form, by groups. Like values, they vary on the continuum from the explicit to the implicit. (Page 411.)

*Value-orientation* refers to those aspects of the actor's orientation which commit him to the observance of certain norms, standards, criteria of selection, whenever he is in a contingent situation which allows (and requires) him to make a choice. Whenever an actor is forced to choose among various means objects, whenever he is forced to choose among various goal-objects, whenever he is forced to choose which need-disposition he will gratify, or how much he will gratify a need-disposition—whenever he is forced to make any choice whatever—his *value-orientations* may commit him to certain norms that will guide him in his choices. The value-orientations which commit a man to the observance of certain rules in making selections from available alternatives are not random but tend to form a system of value-orientations which commit the individual to some organized set of rules (so that the rules do not contradict one another). . . . A culture includes a set of *standards*. An individual's value-orientation is his commitment to these standards. (Pages 59-60.)

The manner in which ends, values, and value orientations become systematized differs from that envisaged by the utilitarian philosophers. The utilitarians looked upon the more ultimate ends and values of a plurality of individuals as being random in character and integrable through the rational pursuit by each individual of his own ends. They largely ignored the tendency of such pursuit to produce conflict. Modern students, by contrast, stress the dependency of the effectiveness of action upon ends being sufficiently compatible with essentially harmonious value orientations and with the resources available for the pursuit of the goals chosen.

Ends and values are systematically organized and integrated at three somewhat distinct levels. They are organized, first of all, within the individual's personality. They get systematized, secondly, within groups



made up of interacting individuals brought together by common work or problems. Such integration is accomplished, for example, within primary and other small groups and within coherent larger organizations, made up of several or more small groups; for within each of these bodies goal-seeking behavior becomes subject to constraints flowing out of the group organization as such. Ends and values get organized, thirdly, in the medium of a community's culture, since considerable consistency of pattern is essential to the survival of cultures. This third level of organization is important in that the individual absorbs or derives most of his values and his goals, together with his conception of the various social roles allocated to him, from the cultural milieu of the community. In fact some constellations of cultural elements may become so internalized in the individual and so much a part of his personality that he becomes very much bound by them and by the relevant moral rules; to the extent that this is the case, the community's culture pattern may be said to have been internalized in the self. In general, while the individual may undergo change and in consequence attempt to modify his environment, he largely reflects it, his mind and self tending to be permeated by the meanings generated and sustained within the community and culture of which he is a part.<sup>2</sup>

Values shared in common by a plurality of individuals make for compatibility among values not so widely held. Values which, being rather general and unspecific, are widely held conduce to this compatibility as also do values such as tolerance which serve to make conflict less intense than it would otherwise be. Multigroup membership produces a similar effect; for each individual must integrate within himself the diverse values which he shares with the members of the various groups to which he belongs, and his so doing tends to exert an integrating influence upon other individuals whose group memberships overlap some of his own. A like influence is exercised by the activities of those members of a society whose business it is to mediate group differences. Presumably differences respecting means deemed appropriate to the realization of values tend to be reduced by increases in the compatibility of values themselves.

Pareto, as interpreted by Parsons, makes compatibility among ends depend upon the existence of a common system of ultimate ends. He divides ultimate ends into two distinct classes: ends "held distributively by individuals and groups within the society so that there arises for every society the problem of distributive justice in the allocation of

<sup>2</sup> *Ibid.*, *passim*; A. R. Lindesmith and A. L. Strauss, *Social Psychology* (New York, 1949), pp. 199 ff.; also W. A. Weisskopf, "Hidden Value Conflicts in Economic Thought," *Ethics*, 1951, pp. 195-202; D. F. Aberle, "Shared Values in Complex Societies," *American Sociological Review*, 1950, pp. 495-502; P. Selznick, "Foundations of the Theory of Organization," *ibid.*, 1948, pp. 25-35; G. Homans, *The Human Group* (New York, 1950), *passim*.

means—above all power and wealth”; and “ultimate ends held in common by the members of the society or predicated on the collectivity as a unit. Only by virtue of these nondistributive elements does the concept, the utility of a collectivity, acquire a determinate meaning.” Pareto thus accepts the sociologicistic theorem that “society is a reality *sui generis*; it has properties not derivable from those of its constituent units by direct generalization.” Underlying this theorem is the central fact that there exists a “*common end* (or *system of ends*) which disappears when individual actions are considered in isolation.”

The ultimate basis of unity on which the whole societal structure rests, therefore, consists, according to Pareto, in the necessarily existing “‘end the society pursues.’ That is, the ultimate ends of action systems are integrated to form a single *common system of ultimate ends* which is the culminating unit holding the whole structure together.” The ultimate value attitudes thus become the source both of the ultimate ends of action and of the ethical norms which regulate action. Accordingly, more than economic considerations enter into the settlement of the conflicting economic claims of individuals, for economic considerations are “subsidiary to political, those of coercive power, so that every economic distribution is possible within a general framework of distributive justice. But all these distributive questions concern only the conflicts of individual claims to wealth and power without indicating the basis of unity in which the whole structure rests.” This basis is the common system of ultimate ends. (Parsons, *Structure*, pages 248-249, 296-297; his italics.)

### III

Information concerning values and value orientations can prove of use to the economist only in proportion as these elements can be isolated and satisfactorily scaled. Isolation and scaling, however, present problems. Values cannot be perceived directly; they can only be known inferentially from the verbal and other behavioral manifestations to which they supposedly give rise. Moreover, only if these manifestations exhibit sufficient regularity and persistence of pattern may they be supposed to issue out of underlying value orientations. It may remain difficult even after a value has been isolated to measure its variation with sufficient precision to permit determination of the significance of this variation for human behavior under given circumstances.

Up to now, information pertaining to human values has been assembled in a number of ways. Students of economic history have discovered value elements such as those associated with the Protestant ethic to be significant for economic behavior. Students of labor problems and industrial relations have uncovered similar elements. Major combinations of value orientations have been indicated. (Parsons,

*Social System*, pages 101 ff.; Parsons and Shils, *op. cit.*, pages 190 ff., 250 ff., 481 ff.) Conflicts of obligations have been studied. It has been suggested that inventories of values and value orientations be cumulated by nation and class, through the study of formal and official documents, creeds, declarations, etc.; through inquiry into the ways time, money, and energy are spent; and through the systematic observation, recording, and analysis of verbal responses elicited by polling techniques.<sup>3</sup> Studies of choosing behavior and the response of individuals and groups to violations of specific values may also disclose how widely and intensely certain values are held. Relevant also are findings concerning the typology of societies and the dimensions in terms of which the culture patterns of individual countries may be expressed.<sup>4</sup> Developments in scaling theory may facilitate both the discovery of values and the indexing of their intensity.<sup>5</sup>

It remains true, however, that only a beginning has been made of the systematic study of values and of the value orientations thereby manifested. Not until inventories of values and their implications for economic conduct have been established, therefore, will it be possible to say whether the promise of value study at the theoretical level can be matched by the contribution of value study at the empirical level to the understanding of economic behavior.

#### IV

Despite the primitive state of contemporary empirical knowledge respecting values and value orientations, economists are aware that elements which normally are excluded from economic models do make responses to price and income changes different from what they would be if the behavior of decision-making units were completely free of the influence of these elements. Included among these elements are values and value orientations. Values and value orientations must, therefore, be taken into account in a variety of analyses, especially those which are historical or comparative in nature; and they may be relevant even to aspects of welfare analysis.

Best known of the historical studies pertaining to the impact of value orientations upon economic and closely related behavior are those of Max Weber and others who have inquired into the effects exerted upon human conduct by elements included within religious

<sup>3</sup> G. A. Lundberg, "Human Values—A Research Program," *Proceedings of the Pacific Sociological Society*, September, 1950; S. C. Dodd, "On Classifying Human Values," *American Sociological Review*, 1951, pp. 645-652.

<sup>4</sup> R. B. Cattell *et al.*, "Cultural Dimensions of Syntality," *ibid.*, 1952, pp. 408-420; C. A. Anderson and Mary Jean Bowman, "A Typology of Societies," *Rural Sociology*, 1951, pp. 255-271.

<sup>5</sup> C. H. Coombs, "Psychological Scaling without a Unit of Measurement," *Psychological Review*, 1950, pp. 145-158, and "Mathematical Models in Psychological Scaling," *Journal of the American Statistical Association*, 1951, pp. 480-489.

ethics. It has been convincingly demonstrated that ascetic Protestantism comprehended elements favorable to the cultivation of science and the development of technology, to the accumulation of capital and the exertion of work and effort, and to the repression of antisocial forms of acquisition. In consequence, "equilibrium" amounts of work, savings, and entrepreneurial effort as such, together with invention and innovation, were greater than they otherwise would have been, and price and income movements were affected accordingly.

Many examples of analogous findings may be cited. Worker motivation and response vary significantly with differences in value systems, studies of primitive and peasant economies reveal.<sup>6</sup> Even in the United States considerable variation is found: the response of workers to incentive systems varies with the value elements present in the groups of which the workers are members, while employee morale and the disposition to put forth effort are affected by values that appear to vary with size of community.<sup>7</sup> Economic restrictionism has been traced in part to "the desire for security and stability and the desire for power and status"<sup>8</sup>—desires which manifest underlying values, some of which may have affinity with those affecting the disposition to put forth effort. Values peculiar to Chinese familism apparently retarded industrial development in China, industrialization presumably being highly compatible only with family systems of the multilineal conjugal type (M. J. Levy, *The Family Revolution in Modern China*). Typological classifications suggest that values making for fluidity and diversity within societies are associated with outstanding performance in the economic sphere (Anderson and Bowman, *op. cit.*).

Since the effectiveness with which an economy can function depends in part upon whether the society embracing the economy is relatively stable and since societal stability depends in part upon the values of a society being sufficiently integrated, the equilibrium of value orientations may be of economic significance. This condition entails, among other things, a suitable balance between aspirations, capacity for achievement, and the norms which govern choice and use of means to achievement.<sup>9</sup>

The importance of values and value orientations varies inversely with the competitiveness of an economy. Under a regime of simple competition, entrepreneurs have little discretion concerning what they

<sup>6</sup> W. E. Moore, *Industrialisation and Labor* (Ithaca, 1951); M. J. Herskovits, *Economic Anthropology* (New York, 1952).

<sup>7</sup> J. C. Worthy, "Organization Structure and Employee Morale," *American Sociological Review*, 1950, pp. 173-174; M. Dalton, "Worker Response and Social Background," *Journal of Political Economy*, 1947, pp. 323-332.

<sup>8</sup> C. A. Anderson, "Sociological Elements in Economic Restrictionism," *American Sociological Review*, 1944, pp. 345-358.

<sup>9</sup> See Parsons, *Social System*, Ch. 7 and *passim*; R. Pieris, "Ideological Momentum and Social Equilibrium," *American Journal of Sociology*, 1952, pp. 339-346; D. B. Aberle *et al.*, "The Functional Prerequisites of a Society," *Ethics*, 1950, pp. 100-111.

must do to survive. Under regimes involving important departures from simple competition, much discretionary influence remains in the hands of the entrepreneur, and he will accordingly give some weight to his own and to the community's values when making decisions. This tendency will probably be even more pronounced if the entrepreneurial function is performed not by one person but by a number of persons, for then political methods must also be employed to arrive at decisions. (See W. Fellner, *Competition Among the Few*, pages 24-25.)

Value theory may be of use to students interested in welfare economics. Pareto's assumption that the action systems of individuals are held together by a common system of ultimate ends makes the satisfactoriness with which questions of economic distribution are resolved depend upon the compatibility of the solutions with the underlying system of ends. Again, Arrow has shown "that the possibility of social welfare judgements rests upon a similarity of attitudes toward social alternatives."<sup>10</sup>

## V

While we have indicated a number of ways in which values may be of significance in economic analysis, we have not specifically indicated the role of sociological value theory in economic analysis. In the longer run, presumably the economist will need to learn how to take the value systems of societies into account. (See A. G. Papandreou, "Economics and the Social Sciences," *Economic Journal*, 1950, pages 722-723.) In the more immediate future, however, since empirical information relating to values and value systems remains sparse and unorganized, it is probable that the economist will make most effective use of value theory when he is carrying on comparative or historical studies. The empirical materials assembled and analyzed through such studies may gradually make possible the incorporation of this matter into the apparatus of economic analysis.

When the economic behavior in similar situations of members of dissimilar cultural groups is contrasted or when economic behavior is studied over a period of time sufficiently long to allow value orientation changes to emerge out of economic or other changes, it becomes both possible and necessary to allow for variations in value orientation. It is likewise necessary to take value orientations into account when the apparatus of economic analysis is enlisted in the service of what may be called manipulative economics.

There appears to be opportunity for the use of sociological value theory in manipulative economics as applied to problems of economic

<sup>10</sup> See K. J. Arrow, *Social Choice and Individual Values* (New York, 1951), pp. 69 ff., Ch. 7; also P. Streeten, "Economics and Value Judgments," *Quarterly Journal of Economics*, 1950, pp. 583 ff.; P. Diessing, "The Nature and Limitations of Economic Rationality," *Ethics*, 1950, pp. 12-26; cf. Parsons, *Social System*, pp. 497-498.



development. While it is generally accepted that the development of underdeveloped countries usually entails marked alteration of values, it is also accepted that value changes tend to accompany or to succeed rather than to precede economic changes.<sup>11</sup> Let us suppose, however, that we have at hand the following materials respecting values in an underdeveloped country: a detailed conspectus of this society's values; information concerning the extent to which identifiable values complement, repel, or serve to replace one another and the degree to which particular values tend to cluster; evidence concerning the distribution of values among individuals and in group memberships; information concerning the conduct-determining influence of particular values; and evidence concerning the mutability and the manipulability of specific values, their accessibility to manipulation, their capacity for generating more than one type of goal, and their susceptibility to replacement by other values. Given information of the sort specified, it would appear possible to change an underdeveloped country's value structure appreciably through the manipulation of those of its values which are both mutable and accessible to manipulation; for changes produced in members of a cluster would tend to modify the whole cluster, while changes produced in both individual values and clusters of values would exert influence upon still other values in the society's system of interdependent values. It may well be, therefore, that analyses along the lines indicated would disclose a strategy and a tactic of value-system modification suited to accelerate the rate of economic development in underdeveloped countries.

In summary, while the long-run prospect of value theory in economic analysis appears to be better than its short-run prospect, the latter can be improved through greater emphasis upon value systems in historical and comparative studies and through the addition of value-system manipulation to the arsenal of manipulative economics. Account will, of course, have to be taken of relations which I have had to ignore; namely, the relations of value orientations to other components of the relevant societal or social system.

<sup>11</sup> See B. F. Hoselitz, "Non-Economic Barriers to Economic Development," in *Economic Development and Cultural Change* (1952), Vol. I, pp. 9 ff.; cf. Parsons, *Social System*, pp. 498 ff.

## THE THEORY OF AN ECONOMIC SYSTEM

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The idea of an economic system is widely used in economic writing and teaching. But this idea is protean in form. In its narrowest scope as a purely price system—a system of determinate exchange relationships occurring within a given universe of data—the concept achieves precision only by being emptied of sociocultural and historical reference. Equipped with this broader reference—as in Marxian, institutional, and historical economics—the concept of an economic system takes on wider meaning. But as scope has widened, content has become more diffuse and questionable. The sins of omission and commission in this regard are sufficiently well known to need only the briefest mention here. Perhaps the sin of monism is the most heinous. This sin takes effect in defining an economic system with reference only to one or two key features and in assuming that structurally significant variation in other features does not occur or is marginal and random in import. Thus with Marx economic systems are reduced to so many different modes of organization of class relationships in production. Elsewhere monism takes the form of differentiating economic systems by the primary ways and means through which the “economic plan”—the fixing of the objects of production, the resources that will be used, and the disposal of products among claimants—is determined. Yet again, crucial stress is laid on the norms by which want systems and incentives are organized.

Coupled with monism is a tendency to discriminate ineptly between the levels or modes of social reality which express “personality” or the working of culture or institutions. The common tendency is to concentrate on one of these levels and to treat the others as residual categories; i.e., to define them in omnibus and negative terms without explicit determination of their principal characteristics (T. Parsons, *The Structure of Social Action*, 2nd edition, 1949, pages 16 ff.). Thus institutions may in Veblenian fashion be reduced to the habits of mind which run through them. Or personality may be considered the mere creature of institutions. Institutions in turn may be regarded as independent of culture or as one-sidedly determinant of them.

Inept discrimination on this level is generally cut across by an inadequate treatment of the historical dimension. This may be either totally omitted and economic systems will not then be differentiated according

to the known characteristics of the historical epochs into which they must fit; or, at the other extreme, the full impress of the unique historical setting will be structurally imbedded in economic systems and the historical dimension will be prescribed with exact linear succession. Either too much or too little or unwise historical specification hampers dealing with the proliferation of systems through historic time and cultural space. By traversing a course of development running from some kind of "genesis" to adult life, systems pass through various "stages." Proliferation in stages is complemented and complicated by proliferation over cultural space. In the real world, systems will not have well-defined boundaries but will interweave with kindred-type systems and with them collectively make up a kind of overlapping order. Thus the idea of an economic system may refer at one and the same time to the collective cosmos of overlapping systems in the totality of their development or separately to any specific component system and its separate development or to some idealized version of these systems regarded as an abstract form and treated in isolation from any empirical counterpart.

The composite effect of inadequate discrimination of basic ideas on personality and on sociological and on historical levels has tended to convert the concept of an economic system from a useful source of insight into a smudge which tends to hamper research, promote sloganizing, and disturb clear thinking. This confusion and lack of consensus dwells mostly, I hasten to add, on the surface level. There has been a broadening course of thought which through this surface confusion has prepared elements or strands of synthesis on a relatively high level of logical articulation and empirical reference. It is this course of thought which, restated in terms of the more active currents of contemporary sociological theory, can take on new significance and achieve wider generality of form. I will attempt in this paper to work out the salient points of such a restatement to the extent permitted by my own appreciation of the literature and ability to think the issues through. In the main, the paper will dwell on the level of analysis where the basic discriminations and ideas and their mutual implications are worked out. We will lapse from this austere level only to provide occasional illustration to bring some point home. To save time, this attempt at restatement is cast in relatively dogmatic form and not in the more fruitful context of doctrinal discussion.

In seeking a starting point, we may mobilize for our purposes the ancient truth that any empirical economic system must be fully involved in the larger overspanning social order into which it fits. This involvement is in every sense of the word thorough. This entails, firstly, recognition that the economic system cannot be regarded as an empiri-

cally self-contained or closed set of interconnections but only as a phase or focal center of a larger whole. Thus some of the functional requirements of the economic system will be discharged through agencies arising elsewhere in the social order; and certain strains which originate in economic activity will find their ultimate issue elsewhere. From this it follows that the tangled mesh of sociocultural reality can be cut through to form the bounds of a determinate economic system only with some arbitrariness though with not the less validity.<sup>1</sup> Finally, the involvement of the economic with the social order implies that the economic system like the social order must not be regarded as a distillate or condensed portrait of concrete behavior but rather as a complex of cultural and institutional patterns. The individual persons who make up the society give life to these patterns by conforming with them in the relevant situations of life. They do this by filling the roles, occupying the status-positions, respecting the norms, and holding the beliefs institutionalized in the social order.

Since the economic system is assimilated into the social order, it may provisionally be defined as a cluster of institutional and cultural patterns which guide economic behavior. This definition, however, does not carry us very far. We need to bring its implicit empirical reference into closer focus. This empirical reference begins to emerge if we realize that it is organized primarily through what Max Weber chose to call "ideal types." In the main, ideal types consist of a selective ordering of things or relationships defined in static terms. They should, however, have some counterpart in the world of action processes. We are not, of course, interested in the processes themselves or in their concrete forms but in the potentialities for action which they contain. Now in economic theory we deal with these potentialities for action chiefly as they are embodied in functional relationships between two or more variables. There is a counterpart to these functional relationships of pure economic theory in the field of sociological theory. This counterpart has been brought out by Karl Mannheim who, on the basis of a suggestion of John Stuart Mill, has developed an analysis of what he called the *principia media* of a social order. These are, broadly speaking, "special relationships of a certain historical phase in a particular social setting." Examples relevant to the functioning of an economic system are: that liberal capitalism generated a highly formal system of law; that enforced unemployment under specified conditions fosters rebellious attitudes; that a large public debt makes possible a

<sup>1</sup>This point was very distinctively presented in Max Weber, "Die Objektivität sozialwissenschaftlicher und sozialpolitischer Erkenntnis," *Gesammelte Aufsätze zur Wissenschaftslehre* (Tübingen, 1922), pp. 166, 170. For the need to allow for articulated subsystems within the social order, see Parsons, *The Social System* (1951), Chs. III, IV, XII; C. H. Cooley, *Social Process* (1918), pp. 27 f.

wider range of democratic process. This type of generalization embodies empirical and quantitative as well as qualitative research on those "hybrid" or "synthetic" problems, as they have been called, which lie on the borderland of the various disciplines. When properly formulated these generalizations can describe the functional relations which tie together structural components of the economic system or which connect the economic system with the larger social order into which it is intermeshed. These functional relations are "mutually related" and hence "form a structure" or "configuration."<sup>2</sup> It is this configuration which we want to incorporate into our version of an economic system conceived in socio-cultural terms.

But still more realism—i.e., specification on a more concrete level—is required. This can be provided by specifying regional characteristics. We speak of river valley societies and coast cultures. The plantation economy as we all know is not accidentally connected with tropical climates. Capitalism arose in a fringe or frontier area with a coastline sufficiently broken to foster extensive maritime skills. As a functioning system, capitalism required the collaboration of different continents and the free run of the oceans. There are many crucial differences between Eastern and Western societies which turn upon the fact that one area cultivates and eats rice and the other bread grains and roots. These examples, which of course could be multiplied, suggest that an economic system must be specified on some level by its regional characteristics. Fortunately, the concept of the region in social-economic analysis has been developed in a series of remarkable works by the great Indian sociologist-economist, Radhakamal Mukerjee.<sup>3</sup>

We have endowed our economic system with typical features, process potentials, and a regional situs. But in what terms can it be regarded as an organized pattern of action? In terms, I would submit, of what in sociological theory is called the functional approach. Now, economic analysis is not alien to the way of thinking embodied in the functional approach. It is in fact common to describe economic theory as a generalized description of the way certain functions are carried out through economic organization. In traditional theory, these functions relate primarily to the determination of an economic plan which selects the productive tasks, allocates resources for their fulfillment, and distributes the product among claimants. The determination of such a plan is a crucial function of all economic systems; and it is a function which has

<sup>2</sup> K. Mannheim, *Man and Society in an Age of Reconstruction* (1949), pp. 173-190; A. Löwe, *Economics and Sociology* (London, 1935), pp. 98 ff., 115 ff., 145 f.

<sup>3</sup> R. Mukerjee, *Man and His Habitation, a Study in Social Ecology* (London, 1940); *Social Ecology* (London, 1940); *Regional Sociology* (1926). Mukerjee develops his analysis of the region in a way that takes due account of the findings of the "geographical school" in sociology. See P. Sorokin, *Contemporary Sociological Theories* (1929), Ch. III; N. Bukharin, *Historical Materialism* (translation, 1925), Ch. V.



been underrated by most institutionalist economists. But it is not the exclusive or the only important function. The brunt of the institutionalist criticism of conventional economics is reducible to the charge that there are other essential functions which are relevant to the make-up of an economic system and which must find some kind of response in that system. These other functions may perhaps be grouped on the ecologic, economic, and institutional levels. (For this mode of classification, see R. Mukerjee's *Institutional Theory of Economics*, Chapter II.) On the ecologic level there is the function of making provision for the economically disabled members of the society, of ensuring support for reproduction, and of conserving or developing the resources of the region. On the more immediate economic level, there is the function of satisfaction of the desire for self-expression or creativity in work, organization of wants into a coherent system, provision of appropriate mechanisms for ordering economic relations with the outside world, provision for stimulating technological progress and wealth accumulation, satisfaction of the desire for stability and security of livelihood, and development of mechanisms whereby diffuse benefits and unallocatable costs can receive their appropriate consideration. On the institutional level there is the function of providing for an adequate circulation of persons within the occupational system, of making available goods and services required to meet collective needs and to provide collective facilities, of devising ways for resolving disputes over working rules between members of the economy engaged in associated activity, of mobilizing incentives for engaging in effortful activity, and for compliance with authority through provision of positive inducements or negative sanctions.

This list of functions as formulated is incomplete, overlapping, and not reduced to the simplest possible form and fewest number. But it does, I believe, give more adequate expression to current levels of awareness of the actual scope for economic organization than does current methodological doctrine. A generation of economists that has been schooled by Marx, Veblen, Schmoller, Marshall, Pigou, Wicksell, Schumpeter, and Keynes necessarily has moved a long way from the Euclidean economics of the utilitarian man with his naked interests, his calculus of desires, his random ends, and his simple society. (On Euclidean economics, see J. M. Clark, *Preface to Social Economics*, pages 40 f.)

We pass on to the next issue: what are the admissible ways and means by which economic functions are carried out? Conventional theory holds that the only ways and means relevant for economic analysis are economic aspects of behavior. This mode of behavior is purely instrumental in form. As such it is carried on only for the sake of the

realized end-product and involves the adaptation of scarce means with alternative uses to multiple and competing ends. This is the common idea which runs through the modern definition of economics as a discipline concerned only with the economic aspects of behavior. It is not presupposed that the concrete behavior involved in carrying out economic functions can be purely economic as thus defined. That all concrete behavior is to varying degrees impure was conceded by the founders of modern economics. It is claimed, however, that the economic aspects of concrete behavior can be detached from their context and separately studied to good effect by a distinct discipline.<sup>4</sup>

In making this claim, conventional economics was obviously influenced by its relatively simple view of functions. This made it easier to see in the noneconomic only so many distracting or random influences to be studied separately. Institutional economics took a broader view of functions and it took a correspondingly broader view of ways and means. It saw that the noneconomic influence over economic behavior was not random but organic and crucial. The noneconomic actually constitutes modes through which economic functions become discharged. There is probably a tendency in every society to de-economize purely economic relationships, to infuse into them or to give increasing scope in them to affective and expressive aspects of behavior, to organize them into going concerns with a code of working rules to which some form of loyalty can be given and which can take on some deeper meaning for the individuals concerned. At the very least the bare repetition of instrumental economic behavior over a long enough time will change the nature of the action. As such it will induce the formation of habits and customs which when institutionalized can provide their own forms of motivation and proximate goals. It might even be said that any particular economic relationship incapable of mobilizing the support of effective noneconomic elements probably tends to be inherently disfunctional. As such it becomes the source of personality maladjustment and social strain.

Moreover, it is only through culture that the wants of individuals can become coherently organized. Culture gets its grip at those points in the individual scale of preference where incommensurable magnitudes must be mutually related. These points appear chiefly when radically different kinds of satisfaction are equated, when quick decisions must be made, when present and future are scaled, when

<sup>4</sup>The classical case for this was made by Schumpeter in his *Das Wesen und der Hauptinhalt der theoretischen Nationalökonomie* (Leipzig, 1908), pp. 76 ff., 88 ff., 554 ff., 581 ff. Parsons' work also centered on this position, which the present author discussed extensively in "Parsons and Mukerjee: An Essay on Ecological Analysis in Social Thought," *Frontiers of Social Science* (a memorial volume in honor of R. Mukerjee, to be published by Lucknow University).

response thresholds are defined, and when the element of the symbolic emerges. In making these decisions, individuals in all societies must apply conventions and norms which are acquired from the culture by learning and which when internalized in personalities become a part of working behavior.<sup>5</sup> In this way a culturally organized scale of preference emerges in the society. This involves a certain range for idiosyncratic orientation which permits discretion in individual taste as against prescriptive orientation through social norms. The objects wanted will be patterned as they are particular to the individual, common to many individuals, or universal among all. Modes of want satisfaction will be patterned by holding individual or optional group consumption in balance with group consumption compulsively organized through the state. (See T. Suranyi-Unger's *Comparative Economic Systems*, Chapter XIV.)

But if the noneconomic is a crucial agency in carrying out economic functions, it in turn will be molded partly to meet economic requirements. It must, to a degree, since the survival of the society involves a minimum level of economic performance and adaptability. Even hardened custom bends under sufficiently strong economic pressure: the rigid Indian caste system makes way for newly emerging occupational groups and wants are molded by new activities. But this adaptability is not automatic; it takes time; it involves a reshuffling of priorities in functions; and it takes effect through a process of cultural growth. Thus the functional priorities and the economic and noneconomic ways and means mutually condition each other as aspects of a shifting cultural process.<sup>6</sup>

This process of mutual conditioning on the cultural level takes on a specifically institutional dimension as the element of organization and regularity in culturally shaped interactive behavior rises to the fore. At rudimentary levels of economic life this element hardly exists. As economic life becomes more settled and productive, interactive behavior patterns cohere or cluster in formations which constantly reappear, which involve vital interests and important physical facilities, which have a continuity of their own, and which play some role in

<sup>5</sup> The role of these norms and conventions, which were so conspicuous in the scale of preference of the Polish peasant (with his high degree of income and use compartmentalization) and which Veblen disclosed in his analysis of a "pecuniary society," were recognized by P. Wicksteed only in the form of "crudities," "errors," "wastes" involved in income administration. See W. I. Thomas and F. Znaniecki, *The Polish Peasant in Europe and America* (1927), pp. 157 ff., 164 ff., 166 f., 181 f., 202 ff.; P. Wicksteed, *The Commonsense of Political Economy* (London, 1933), Vol. I, Ch. III. For cultural shaping of time-preference patterns, see J. M. Keynes, *The General Theory of Employment, Interest, and Money* (1936), Ch. XII; A. Marshall, *Principles of Economics* (8th ed.), pp. 224 ff.

<sup>6</sup> See Veblen and Marshall on this mutual give-and-take or "contamination" process. Veblen, *Instinct of Workmanship* (1908), pp. 84 ff.; Marshall, *op. cit.*, pp. 86-91, 218 f., 728 f.

the discharge of every function. These nuclear formations of interactive behavior patterns constitute what are generally called the basic economic institutions of which six stand out clearly: property, money, city, industry, agriculture, and a leisure class. There are other economically related or conditioning institutions, such as family, state, and church, but only these six concern modes of interactive behavior which are primarily economic in their focus and which necessarily emerge at all levels of economic life above the rudimentary.

The first is property. We all know that what in terms of process is seen as division of labor must appear as property to the individuals concerned in defining their relations to their products and the facilities of production. We also know that property is not a simple lump but an ensemble of discrete rights, immunities, and forbearances which can be combined in different ways within the same type of social and cultural order.<sup>7</sup>

So it is with money, another basic economic institution. Some form of money emerges whenever indirect exchange achieves a certain degree of complexity and stability. Once emerged as a commodity, money tends to become conventionalized and to that extent capable of being refined and of becoming an object of social control. Thus institutionalized money takes on a wide variety of concrete forms.

So it is also with the city, which, as Adam Smith emphasized, is fundamentally an economic institution. As such it must emerge at advanced levels of division of labor. With industry, it takes its point of departure in drawing away raw materials from scattered primary producers and consigning their fabrication to specialized producers. These can best perform their functions by locating at some spot where the physical circulation of matter is easily arranged, where market access is convenient, and where the economies of further specialization may be realized.<sup>8</sup> The city, industry and agriculture which thus become differentiated are capable of assuming a wide variety of institutional forms. For agriculture, this variety turns chiefly around modes of land tenure, settlement, and husbandry, and takes on such concrete embodiments as the manor, the village community, the plantation, the extensive family farm, the peasant household, the capitalist farm rented from landlords, and employing wage labor.<sup>9</sup> For the city, institutional varia-

<sup>7</sup> K. Marx, *German Ideology* (translation, 1939), p. 22; J. R. Commons, *Institutional Economics* (1934), pp. 87 ff.; Suranyi-Unger, *op. cit.*, Ch. X.

<sup>8</sup> A. Smith, *Wealth of Nations* (Modern Library ed.), pp. 17 ff., 373 ff.; Marx, *Capital* (Modern Library ed.), Vol. I, pp. 387 f.; Max Weber, *Wirtschaft und Gesellschaft* (Tübingen, 1922), Ch. VIII, "Die Stadt," particularly pp. 522 ff.; Weber, *General Economic History* (translation, 1927), pp. 317 ff.; A. Hawley, *Human Ecology* (1950), pp. 216 ff.; W. Sombart, *Der Moderne Kapitalismus* (Leipzig, 1902), Vol. II, pp. 191 ff.

<sup>9</sup> See the treatment of this institutional development in Weber, *General Economic History*, pp. 74-109; Suranyi-Unger, *op. cit.*, Ch. XVIII; J. S. Mill, *Principles of Political Economy*, Book II, Chs. VI-X.



tion has chiefly turned around scope of services provided, patterns of nucleation, self-sufficiency or dependency, degree of self-organization and degree of mobility, protection, monopoly and regulatory control, collectivized want consumption, and religious sharing. The city thus emerges in a specific cluster of institutional types running a range between the small dependent community, the industrial city, the modern metropolis, the fortress city, the exploitive warrior city, the plebian city, and the like.<sup>10</sup> The institutionalized forms of industry, e.g., the domestic shop, the craft guild, the capitalist enterprise, the quasi-public corporation, are well known.

The institution of the leisure class has been treated so thoroughly and subtly by Marx, Veblen, and Pareto that it suffices here only to refer to their work. Some kind of leisure class or economic elite with exemption from the industrial employments and relative monopoly of the higher status employments necessarily emerges as economic life becomes organized above the rudimentary level. The functions of the leisure class are varied but they will include that of giving general direction to the productive process, of organizing access to facilities of production, and of controlling the distribution of the product. It is unnecessary to add that the leisure class can take on a variety of institutional forms.

These economic institutions may vary in given settings. Their range of variation widens at the more advanced economic levels. To reach these levels institutions go through a process of more or less autonomous development which may be traced as it cuts through social orders and cultural contexts. Only to a limited extent are these institutions adaptable or subject to deliberate social control and for the most part they are prescriptive in their working.

In these ways we realize that economic institutions have a certain historic and functional individuality. We also realize that they cannot vary at random in a given society. They make up a *Gestalt* which must be mutually consistent in terms of requirements and adaptability. Thus any very complex form of economic life requires, among other things, a more highly conventionalized kind of money, a more elastic kind of property, a less self-contained kind of city, a more productive form of agriculture, and a more energetic leisure class. Any given institutional *Gestalt* will tend to induce an adaptive pattern of functional priorities and ways and means. Functions previously submerged may call for specialized handling, while old ways and means may be out of tune with changed institutions. Commons in his *Institutional Economics* (page 738) expressed these adaptive patterns by noting that when

<sup>10</sup> See Weber, "Die Stadt," *loc. cit.*, pp. 315-337; Hawley, *op. cit.*, Chs. XIII-XV; Mukerjee, *Social Ecology*, Ch. V; Sombart, *Moderne Kapitalismus*, Vol. II, Chs. X-XII.



"efficiency increases then scarcity diminishes, a variation in the working rules occurs as well as of expectations of the future, and perhaps of the use of sovereignty." There will in these respects be a mutual give-and-take which, as Mukerjee has pointed out, will rise from level to level, from the ecologic to the institutional.<sup>11</sup> Tendencies toward adjustment may only express interdependency but they may rise to the higher level of equilibrium or a moving balance.<sup>12</sup> This mutual give-and-take between institutional forms, functional priorities, and ways and means will assume forms both subtle and organic. The interlinkages involved are illustrated by the case of capitalism which may in these terms be defined as a *Gestalt* fused of the following elements: a commodity money conventionalized at a high level, a highly absolute form of private property, a want-structure with primacy on individualized modes of consumption and stress on emulative pecuniary norms, a specifically Western type city with minimum social control, individualized capitalist farms, the capitalist enterprise, functional primacy on the economic plan, relative neglect of ecologic and institutional functions, primacy on utilitarian ways and means, and an energetic and productive leisure class.

To what extent should this interequilibrated system be endowed with some kind of historic dimension? I think we should take full account of the implications that are in so simple a proposition as the assertion that every empirical economic system has to be fitted into history. This of course means that an economic system must be related to a historical environment which is malleable only to a limited degree. Thus the modern capitalist economy presupposed and went hand in hand with a relatively high level of scientific achievement. The two cannot be divorced from each other, nor can either be assumed to function in a society equipped with the industrial technology of the early Egyptians. There has been a pattern of historical development which has involved specific relationships between certain levels of culture, scientific knowledge, social technology, industrial arts, religion. The fact that the historical development has not been rigidly linear or everywhere uniform should not be permitted to blot out the fact that it did occur, though within limits that vary considerably from area to area and period to period. It is within such limits that it would seem to make sense to affix a historical specification on types of economic systems.

But there are reasons why this historical specification should be complex in character. The reasons for complexity can perhaps best be

<sup>11</sup> Mukerjee, *Institutional Economics*, pp. 65, 84, and Chs. II, III, XV; *Social Ecology*, pp. 335 ff.

<sup>12</sup> A. W. Margat, *Theory of Prices* (1941), Vol. II, pp. 406-449; Commons, *Institutional Economics*, pp. 69 ff.

brought out through illustrations of which I have picked four: Protestantism, colonialism, population increase, and the national state. A case can be made to support the assertion that the rise of capitalism was structurally connected with the Protestant Reformation. In a broad way, this assertion spells out the implications of the general connection traced by most cultural historians between the Reformation and the emergence of the "modern" world and its characteristic attitudes. We all know the subtlety of analysis and large body of proof which Weber, Troeltsch, and Tawney mobilized in support of their stand on this question. Assume for the moment that we can accept their conclusion. This does not entail that the Protestant ethic be deemed a structural ingredient of capitalism. Weber was the first to point out that with the development of capitalism the specifically religious expression of its outlook vanished and that its outlook became wholly secularized and shifted in orientation. Hence capitalism was able to spread into areas where it could never have originated and to adapt itself to forms of belief which originally would have been incompatible with it.

Colonialism was associated with the discovery and utilization on a large scale of tropical lands and peoples and with such crucial products and materials as tobacco, sugar, cotton, and tea. In these respects, colonialism accelerated maritime activity and commerce, fostered new wants as inducement to new forms of activity, and formed new sources of riches. These all were so many means of dislocating the old society. In these respects, historical research indicates that colonialism was necessary to the rise of capitalism. Was this role still involved in the nineteenth century when capitalism had achieved its own foundations? Was colonialism then a structural ingredient of capitalism which reflected its essential unevenness of make-up? Was it a structural hang-over from the period of genesis? Was it essentially a by-product of the presence of feudalized ruling classes and feudal attitudes? Or should colonialism be considered a phase of the expansion of Western civilization and its rise to world power—a phase which ran its course concurrently with capitalism but is not fully identified with it?

Similarly disturbing questions are encountered in the field of population. Much of the surface history of the nineteenth century ordinarily categorized as capitalist is traceable to the amazing population increase which in that century almost tripled Europe's population. This population increase rendered the society more mutable; it accelerated the proletarianization of the labor force; it pushed ahead the geographical spread of capitalism through overseas migration; it stimulated the speedier rise of unplanned urban areas peopled by uprooted rural migrants; it made Europe increasingly dependent upon overseas imports of raw materials and food; finally, it helped upset the balance

of power upon which the peace of Europe was founded.<sup>13</sup> To what extent, now, should this population increase be considered a structural ingredient of capitalism? Assertion of structural relationship is on its face a tenable position. It was upheld, not only by the classical economists and Marx, but as strictly by Schumpeter and to a degree by Sombart and many population specialists. This position is supported by the obvious relationship that existed between capitalism, industrial expansion, rationalization of life generally, the improvement in conditions of public health and of medical practice, and the marked fall in death rates. Yet the case of France shows that capitalism sometimes could call for people and obtain a muted response.<sup>14</sup> The French experience was proved later to be not the exception but the forerunner of the universal rule that under capitalism population sooner or later began to fail to reproduce itself. And a very persuasive case has been made that this outcome was inherently attributable to the rationalization of life produced by capitalism, its insecure mode of existence for large masses, its dissolution of traditional ideas, the cult of personality and spirit of ambition which it fostered, and the expense of raising children under its conditions.<sup>15</sup> If this is true, then the population increase was not a primary attribute of capitalism but was a lagged response upon which is writ large the impress of the historically accidental.

Difficulties no less perplexing are encountered in coping with the problem of the national state which has been defined as an essential ingredient of capitalism considered as a system.<sup>16</sup> On a sufficiently concrete level of reference, this specification makes sense. The habitat of capitalism at its birth was a broken up peninsula whose population was bound together by a common culture but was differentiated into emerging national groups which differed in position, self-organization, and power. Under these conditions it was understandable that capitalism would develop unevenly and that the most developed capitalist country was able to build up a world empire. She was also able through fostering the balance of power to prevent her European neighbors from becoming consolidated into a single polity which she herself was unfitted to organize. These were the general conditions under which the national state became a distinct characteristic of capitalism. But if the

<sup>13</sup> Mukerjee, *Political Economy of Population* (London), pp. 247 ff., 338 ff.; W. Röpke, *Gesellschaftskrisis der Gegenwart* (Zurich, 1942, 4th ed.), pp. 180 ff.; W. Thompson, *Population Problems* (1935, 2nd ed.), Ch. XXIII; P. Mombert, *Bevölkerungslehre* (Jena, 1929), pp. 170-194.

<sup>14</sup> See J. J. Spengler, *France Faces Depopulation* (1938), Ch. I.

<sup>15</sup> *Ibid.*, Ch. VII; Mukerjee, *Political Economy of Population*, pp. 247 ff.; Thompson, *op. cit.*, Ch. XI.

<sup>16</sup> J. Burnham, *The Managerial Revolution* (1941), pp. 18 ff., 172 ff.; K. Polanyi, *The Great Transformation* (1944), pp. 3 f.

national state is thus specified as an ingredient of capitalism, there must also be included the balance-of-power system of international politics and the hegemony of England over Europe and in world politics generally. But this is practically the same as saying that nineteenth-century civilization was as British-centered in its politics as it was in its economics. Perhaps capitalism should be specified down to this level of concrete description. But at this level of specification it includes a temporary population increase, the rise of an American republic, the maintenance of a colonial system, and a whole series of forces which were a part of the historical setting in which it became embodied.

I think these illustrations bring out three distinct issues. In the first place, they imply that historical specification can probably dwell on many analytical levels according to the purpose on hand. But specification must be consistently applied on whatever level it chooses to dwell. Failure to observe this canon has tended to vitiate many important generalizations found in Marxian writings. Secondly, these illustrations suggest that a distinction should be drawn between the economic system defined in a stage of genesis and in a more fully developed stage. Finally, on this basis we can take cognizance of the important process of cultural diffusion by which advanced social forms and traits may be taken over by simpler societies and adapted to their needs through amalgamation or selective borrowing. A given socioeconomic form once evolved will thus tend by a process of cultural diffusion to produce a variety of hybrid types which of course will make up an environment which will react upon the originating society. Thus no historically existent economic system can be regarded as a single type with distinct stages but must in its essential nature be regarded as a family of hybrid types arising out of an interacting process of diffusion and development.<sup>17</sup> But it is also true that the common form and principles which run through all the hybrid types and stages may be regarded as an idealized form of which they are varying embodiments. Probably this is as far as we can go in stripping an economic system of the impress of its historical setting. But this idealized form must always be regarded in close connection with the family of hybrid types and stages whose common features it expresses. In any case it makes no sense to contrapose one to the other, or to argue that the acceptance of one renders the other unnecessary or that the relationship between the two is one of mystic infusion.

This discussion of cultural diffusion leads into the general issue of

<sup>17</sup> On cultural diffusion and "borrowing," see Sorokin, *Cultural and Social Dynamics* (1941), pp. 197-288; L. Trotsky, *History of the Russian Revolution* (translation, New York, 1931), Vol. I, Ch. I; Veblen, *Imperial Germany and the Industrial Revolution* (New York, 1915), Ch. II.

the role and nature of boundary lines which by implication have been incorporated into the concept of an economic system. The simple fact is that boundary lines between societies have been rigidly drawn only in exceptional cases and mostly for some preliterate or specially isolated peoples. Most societies and all highly developed ones have been more or less solidary with neighboring societies and they have, as Toynbee recently has pointed out, grouped themselves into complexes which may be called civilizations. Within these civilizational complexes there will generally prevail a relatively high degree of multinational integration with some overt institutionalization: a common culture including a faith or the elements of a common language; extensive interaction, cultural diffusion, and a kind of moral solidarity; and, where techniques permit, a large amount of mutual trade and division of labor.

The implications of this overlapping of social orders into larger civilizational complexes have not been as carefully considered in the social sciences as they deserve. There has been all too much tendency to theorize about, and for, a nonexistent, distinct, or isolated society whether in its economic, social, or political aspects.<sup>18</sup> Yet we are presented here with a very real dilemma. Federalization and civilizational solidarity has almost everywhere gone far enough to affect significantly the internal systems of the component societies and to constitute some form of overlapping order with its own functional requirements and emergent properties. This was true of the nineteenth century Western World, as it was of medieval Christendom, classical China, the Moslem world, or pre-British India. Yet federalization has only in a few cases been carried to the point where the boundary lines of a distinct society with its separate economy and state have been rubbed out. I merely present this dilemma with the rather obvious suggestion that, since it is real and not spurious, it be respected. Societies and economic systems are both distinct and overlapping, and they are neither fully isolated and self-maintaining nor fully consolidated and federalized.<sup>19</sup> We should thus recognize that an economic system is a highly complex concept. It should denote an ideal-type form resolvable into a family of hybrid stages and types of systems united more or less loosely in civilizational complexes and identified individually in terms of a more or less integrated pattern of functional priorities, ways and means, and an institutional *Gestalt*.

<sup>18</sup> See for criticism of the unitary society theorists: Sorokin, *Society, Culture and Personality* (1947), pp. 306 ff.; R. Luxemburg, *Einführung in die Nationalökonomie* (Berlin, 1925), pp. 13-44; and my critique of Parsons, "Parsons and Mukerjee," *loc. cit.*

<sup>19</sup> We must, that is to say, learn to think in Hegelian terms; for the union of something which is and is not becoming. See Hegel's *Wissenschaft der Logik*, Vol. I, Ch. I. In their Polish peasant volume (cited above), Thomas and Znaniecki stated social theory should revolve around "the analysis of the totality of social becoming." (Vol. I, p. 36.)



## SOCIAL MOBILITY AND ECONOMIC ADVANCEMENT

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During the past decade or more, studies of social mobility by sociologists have tended to postulate the vertical movement of individuals among fixed strata of power, prestige, or consumption. Meanwhile studies by economists of the distribution of wealth and income have tended to conceive of the flows of reward within a given, functioning whole, a system in continuous equilibrium. Abetted by distinctive vocabularies, the two disciplines have largely pursued independent though parallel paths through this part of the wilderness of human behavior.

Since World War II, however, the emphasis of public and professional attention has been shifting toward the current-historical process of social and economic development. As a consequence of this practical and theoretical reorientation, scholars in sociology and economics have found their interests converging at various points. Interdisciplinary studies of labor markets, consumer behavior, and—as on the present occasion—values and population dynamics have encouraged the sharing and sharpening of certain concepts, and clarification and elaboration of the developmental model of change. No area is more pressing in its demand for further threshing out of common empirical and theoretical problems than that denoted from our two perspectives as social mobility and economic advancement. We are grateful for this opportunity to set forth before economists certain implications of modern stratification theory for economic analysis. We do this in the form of five positive propositions, defended with evidence and argument derived from interdisciplinary efforts to date, but we are frankly more concerned to propose lines of collaboration with economists in the near future than to claim satisfaction with the recent past.

### I

*Analysis of Colin Clark's Miscellaneous Category of Tertiary Industries Leads to a Significant Distinction Among Quaternary and*

<sup>1</sup> Deceased.

*Quinary Industries.* No single recent work in economics engages the sociologist interested in changes in stratification quite as much as Mr. Clark's *Conditions of Economic Progress*. To us it appears fundamental. Some economist friends whisper to us that Clark is not really a theorist, but his major thesis on the connection of rises in real income with the flow of labor into tertiary industries constitutes at least the pedestal of a systematic basis for predicting the sequences of development. It can readily and usefully be elaborated for such a purpose if his third category is broken down into three distinct categories of service industries.

The first of these we shall again call tertiary industries, defined as domestic and quasi-domestic services: restaurants and hotels, barber and beauty shops, laundry and dry cleaning, repairing and maintenance, and the sprinkling of handicrafts, once performed at home, which Clark lumps with "small scale manufactures." These may still appear a miscellany, even allowing for marginal cases, but if the principle of tracing them to the home is followed, they can be quite inclusively identified.

Next, under the caption of quaternary industries we shall group transport, commerce, communication, finance, and administration. The principle governing this grouping is that these are the industries which facilitate or effectuate the division of labor. Their office is to knit together in a working system the specialized producers of raw materials, manufactured goods, and other services. The enlargements of productivity added to any economic unit by each increment of co-ordinate specialization have gratified economists from Adam Smith to Clark himself, though popular opinion still suspects these industries of being nonproductive. Henry Ford used to fire clerical workers in droves on this account, only to hire them and more back again within a few weeks.

Logically and empirically, quinary industries as we shall define them are not once more a residual category. These industries comprise medical care, education, research, and recreation (including the arts). The principle which guides this grouping is that they all have to do with the refinement and extension of human capacities. They differ from the domestic and quasi-domestic tertiary industries in that they are not devoted simply to the maintenance of individuals in the style to which they are accustomed but to the cultivation of behavior to which they are not accustomed. It might almost be said that in the sequence of social and economic development, their office has emerged as that of engendering social and economic development itself. The product of their operation is to feed back into the working of the previous four kinds of industry new increments of ability, skill, and knowledge—just as each of the other kinds contributes to the efficiency and output of its historical progenitors.

When its components are examined, elaboration within the quinary grouping can be observed going on at an astonishing rate. As Mr. Truman declared last November, the already burgeoning expenditure on hospitals, medical care, and research is only the prelude to a vast American investment in human resources. And Mr. Slichter ventures that the next wave of industrial activity to succeed rearmament will be a program of school-building big enough to sustain full employment. Scanning the world scene, Clark mentions sport and entertainment only in passing, but recreational industries in the United States must now account for a several times bigger chunk of our national product than does education. He does not mention research at all, even in his second edition, perhaps because even by 1951 official statistics had not registered its astronomical growth as an industry.

Now there is an old doctrine among sociologists upon which Clark's findings have cast mounting suspicion. That is the dogma that social stratification is the inevitable consequence of functional differentiation. According to this view, as the division of labor progresses, the need for co-ordination thrusts the various co-ordinators continually upward in a hierarchy of status and reward; primitive societies can be relatively equalitarian, but heightened stratification is the price of economic advancement. A popular corollary identifies the rate of economic advancement with the rate of social mobility: in ascending to higher levels of the system, enterprising individuals contribute to the efficiency of its operation; thus from the policy standpoint, economic progress is encouraged by keeping channels open for vertical movement. A final corollary is said to follow: flattening the range of possible vertical movement depresses the motivation to rise and heightening the range stimulates it. The evidence against these doctrines is impressive.

First of all, mass production of the sort implied by extreme division of labor depends upon the existence of a mass market, and the existence of a mass market depends upon the "massification" of taste. If consumers would accept the same standardization in homes which they accept in automobiles, inefficiencies in building and costs of housing would not be so deplorable. Comparison of the men's and women's clothing industries furnishes another illuminating example of consumer limitations upon productivity. The disintegration of sumptuary standards, especially under the impact of mass communication media, receives much attention from contemporary students of stratification. Its relationship with economic advancement is circular: because it is beneath the dignity of no one to eat Campbell's Soup, everyone can afford it.

In recent years the range of income distribution has been pulled in at one end through subsidization of consumption and the establishment

of minima; at the other through progressive taxation, accompanied by direct standardization of wage and salary brackets. Does it matter if these trends are regarded as causes or effects of rising real income, as long as it can be determined that they are connected? Defense expenditures, especially on soldier pay and pensions, appear to support these trends. Clark's data show that "the same amount of income comparatively equally distributed will create a greater relative demand for manufacture than if it is unequally distributed" (page 355, *Conditions of Economic Progress*, second edition), and the same obviously goes for college educations as for automobiles. Social demand for greater equality may thus lead to economic demand which may in turn make it possible to develop the productivity which makes possible the degree of equality, as Clark says, that perhaps only an advanced society can afford. Thus in judging social values, we may as a society be on the verge of discovering that general economic advancement and social equalitarianism are interdependent, while retention of steep stratification and rivalrous personal mobility is economically stultifying. Scientifically, verification of such a hypothesis would precipitate us into deep reconsideration of the problem of values and motives. Fortunately, we can report that modern stratification theory is no longer ducking this issue as much as when attention was centered on the structure of small communities.

Although our interest is primarily in the latest trends of industrialization in the United States, important implications for economic development of backward areas emerge from this latter-day slant on social mobility and economic advancement as values and motives. It is more than conceivable that backward areas will make their most rapid gains less by the recapitulation of nineteenth-century entrepreneurship and more through public investment in quaternary and quinary industries. Maybe, indeed, the robber barons who took from the public treasury to build the railroads were doing exactly this.

## II

*Occupations in All Industries Show a Trend Toward Professionalization.* Clark rightly distinguishes industry, occupation, and social category and deals primarily with the first. Just as over time there is a flow of labor from the primary and secondary industries into the more advanced, there is a progressive net movement from the unskilled manual occupations into the educated ranks of the professions, even within older industries. These trends, though independent, are correlated. The primary industries—farming, forestry, fishing, mining—still mainly employ manual workers of limited training; the majority of employees in quinary industries are professionals. Moreover, inter-

vening kinds of industry employ crudely corresponding proportions, judging from the gross classifications of existing data. We await with extreme interest the publication of results from the current study of labor mobility by the Labor Market Research Committee of the Social Science Research Council. Sociologists and economists need to join in getting better classifications worked into the 1960 census of occupations than will appear in the 1950 one when it finally comes out.

Various available sources testify both to transfers of labor among occupations and to transformation of jobs within types of occupations:

1. Agricultural employments (also mining, fishing, forestry) show steep decline as a percentage of the total gainfully employed population of the United States. Among those remaining, steady increments of specialization and technology are slowly carrying the nature of the work in the direction of a profession practiced in terms of scientific theory rather than empirical skills. This trend is induced primarily by the extension services and the state colleges and experiment stations.

2. Manufacturing occupations have held a slightly diminishing proportion of the gainfully employed for two and perhaps as many as three decades. This trend would appear much more marked if census figures took account of the net displacement of lower skills by automatic machinery, and of higher skills by engineers. In fact, more precise analysis of the transformation of manufacturing jobs would probably show quite spectacular changes, especially in the mechanical industries.

3. While domestic servants have declined in importance, especially under the impact of equalization of incomes, employment in quasi-domestic service seems more or less to counterbalance this trend. Thus the occupational change here is dramatic but almost wholly qualitative—visible in higher wages, greater specialization, mechanization, improved techniques, unionization, and enhanced social status of workers in the personal service trades. The chefs and so-called "building engineers" in this hotel, for example, probably enjoy a better standard of living than most of this audience and may be better able to send their children to college. (Chicago, by the way, has 1,300 hotels.)

4. The clerical, fiscal, and administrative jobs which predominate in quaternary industries have expanded vastly in numbers and proportion in recent decades. If anything, the figures show them reaching right now the steepest part of their upward curve of ascent. Nevertheless, signs also suggest that they are very close to the crest of their development and may even within this decade start downward, proportionally speaking. Invention and adoption of business machinery for handling routine clerical operations will be the most responsible factor. Even without unionization, incomes of white-collar workers have trailed



those of manual workers so closely that employers are powerfully induced to substitute such machinery wherever feasible. Secondly, the development of packaging and self-service schemes, as in supermarkets, is depressing employment rapidly in retail selling—the largest single category of distribution employees. Rationalization and mechanization also affect transportation and materials handling. Efficiencies in organizing the flow of goods so strongly counter the growth of trucking and aviation that transport as a whole had probably reached the peak of its share of employment by 1940. This should be disclosed when the new census of occupations comes out. It is somewhat ironic that employment is also being reduced by the division of labor in those industries which effectuate the division of labor in other industries. Even supervisory jobs can be analyzed and distributed among staff specialists, as the disintegration of foremanship has already shown.

5. Finally, though professions do not yet show as great relative increase as the clerical trades, their upward curve is steepening. As jobs in primary and secondary industries are converted into one kind or another of engineering, engineers will overtake teachers, now the largest category of professionals; but, barring catastrophes, we may expect the scientists and artists in the research and recreation industries to come close behind.

The professionals paid by fee will become more insignificant in the total than they are already. A thoughtful business leader, Colonel Robert Wood Johnson, who manufactures medical supplies, claimed recently that since more than half the working force is already salaried, both political parties are out of tune with the times. The full social significance of this rapid transition from a wage-earning to a salaried population can hardly be appreciated, much less anticipated. A few obvious implications stand out: incomes tend to stabilize and equalize as salaries predominate; though high in status relative to other occupations, the salaried professions are socially near equals. The many facets of professionalization significant for economic analysis cannot be sketched here, but one more must be mentioned, because it goes so far toward controverting the claim that division of labor inevitably heightens stratification: a major distinction of professional from other types of employment is that, even though part of a large organization, professionals work with minimal supervision; co-ordination of their activities is accomplished primarily by well-understood procedures of departmentalization, scheduling, budgeting, and reporting.

The concept of occupational mobility which has guided a number of recent sociological studies of stratification refers to some sense of social rank or prestige—a dimension of higher or lower in esteem and desirability. Before venturing our next proposition, which links in-

dustry and occupation to social categories in that sense, one critical comment seems in order regarding those studies. Many of them possess a deficiency to correct which may require the collaboration of both sociologists and economists interested in stratification. That is the poverty of precise concepts and measures for analyzing net vertical mobility among particular segments of a society. Social mobility—unlike “labor mobility,” which it may underlie—is an invidious conception; it implies place relative to others. If everyone moves upward by some absolute standard, none moves by the invidious standard. It should thus be clear that social mobility and economic advancement occur independently. Nevertheless, many studies of social mobility arrive at their conclusions simply by comparing the occupations of sons with the occupations of their fathers without subtracting the influence of the flow of labor into the more advanced occupations. Consider simply changes of occupation during the career of a single individual: the effect of general economic advancement, whether measured by occupational development or real income, must be subtracted from his total movement to ascertain whether he has risen at all in the social scale. Otherwise there is only lateral labor mobility and real economic advancement, and our notions of social mobility and stratification are meaningless. Common-sense impressions of the frequency and degree of social mobility grossly overestimate it.

Complicating the same problem of precise definition and measurement is the matter of absolute steepness or flatness of social and economic hierarchies. Economists have a measure like the Pareto coefficient to express the general inequality of incomes in a single index. Sociologists as yet have no way to express the corresponding steepness or flatness of social hierarchies except crude counting of social categories; yet it is undoubtedly the case that to rise to the top of a relatively equalitarian society is much less or much more of an achievement than to do the same in a relatively stratified society, depending upon where one starts and what barriers he encounters along the way. Modern stratification theory has unfortunately not achieved the methodological refinement of a field like population analysis.

### III

*Occupational Change and Movement in the United States Have Raised the Prestige Level of the Average Occupational Position in the Labor Force.* Or, perhaps better the other way around, net occupational movement has been toward the jobs of higher prestige. When the results of studies of occupational shifts are considered in the light of findings from studies of occupational prestige, there can be no doubt that expanding occupations on the whole are those of higher prestige

levels, whereas the contracting occupations are on the whole found at lower prestige levels. All studies, regardless of their method of classifying occupations, point to this phenomenon.

Using the customary census classifications, Bernert reports that between 1910 and 1940 white-collar occupations, both professional and clerical, showed the sharpest rates of increase, while operatives and service workers also increased at a rate greater than that for the labor force as a whole. Proprietors, managers, and officials, as well as craftsmen and foremen, lagged behind the rates of growth for the total labor force, while the category of unskilled labor showed enormous loss, both absolutely and comparatively.<sup>2</sup>

Palmer and Ratner show that these changes not only continued beyond 1940 but in many cases were intensified after that date. Thus Table 1 showing change by industrial classification underscores the growth of the tertiary, quaternary, and quinary industries.

Anderson and Davidson report similar findings. Using Alba Edwards' socioeconomic grouping of occupations, they show that for nonfarm occupations the rate of increase with certain exceptions is roughly proportional to position in the ordering of the occupational groups by status<sup>3</sup> (Table 2).

Further evidence that the expanding occupations are of relatively high status and the declining of low status can be found in the study of occupations by the National Opinion Research Center in 1947.<sup>4</sup>

In the light of democratic values, such consequences of economic advancement are fortunate indeed, since it is not characteristic of history to bring people just the things they want. It would be wrong, however, to attribute this happy outcome to some form of social teleis, although this warning does not mean that such a development is unfit as a goal for public policy. To see how this coincidence has come about requires a two-dimensional analysis of the occupational structure. One of the authors suggested such an approach a few years ago<sup>5</sup> and it seems worth while to apply his mode of analysis to the 1910-40 comparison.

If it be assumed that jobs and occupations have status values which are hierarchically distributed and, in addition, possess qualities which

<sup>2</sup> Eleanor Bernert, "Changes in the Occupational Structure of the Labor Force in Chicago, Philadelphia and the United States, 1910 and 1940," in Paul K. Hatt and Albert J. Reiss, Jr. (editors), *Reader in Urban Sociology* (The Free Press, Glencoe, Illinois, 1951), p. 342.

<sup>3</sup> H. Dewey Anderson and Percy E. Davidson, *Recent Occupational Trends in American Labor* (Stanford University Press, 1945), p. 133.

<sup>4</sup> Cecil C. North and Paul K. Hatt, "Jobs and Occupations: A Popular Evaluation," in Logan Wilson and William L. Kolb, *Sociological Analysis* (Harcourt Brace and Company, 1949), p. 467.

<sup>5</sup> Paul K. Hatt, "Occupations and Stratification," *American Journal of Sociology*, May, 1950, pp. 533-543.

TABLE 1  
INDUSTRIAL AND OCCUPATIONAL TRENDS IN NATIONAL EMPLOYMENT  
BY GLADYS L. PALMER AND ANN RATNER

(Taken from Table 6, page 19, Research Report No. 11, Industrial Research Department, Wharton School of Finance and Commerce, September, 1949.)

OCCUPATIONAL GROUP	Employment per 10,000 Population			Net Changes 1910-40		Net Changes 1910-48	
	1910	1940	1948	Num-ber	Per Cent	Num-ber	Per Cent
Total—all occupations	3,866	3,430	3,987	-436	-11.3	+121	+ 3.1
Professional and semiprofessional workers	174	254	280	+ 80	+46.0	+106	+60.9
Proprietors, managers, and officials	946	675	755	-271	-28.6	-191	-20.2
Farmers and farm managers	667	390	319	-277	-41.5	-348	-52.2
Proprietors, managers, officials, excluding farm	279	285	436	+ 6	+21.5	+157	+56.3
Clerical, sales, and kindred workers	409	571	749	+162	+39.6	+340	+83.1
Clerical and kindred workers	217	350	502	+133	+61.3	+285	+131.3
Salesmen and saleswomen	192	221	247	+ 29	+15.1	+ 55	+28.6
Craftsmen, foremen, and kindred workers	439	384	554	- 55	-12.5	+115	+26.2
Operatives and kindred workers	558	656	838	+ 98	+17.6	+280	+50.2
Service workers	376	423	411	+ 47	+12.5	+ 35	+ 9.3
Laborers	964	467	400	-497	-51.6	-564	-58.5
Farm laborers and foremen	527	234	176	-293	-55.6	-351	-66.6
Laborers, except farm	437	233	224	-204	-46.7	-213	-48.7

SOURCES: Data for 1910 and 1940 from Appendix III; data for 1948 from United States Bureau of the Census, Series P-60, No. 5, *Current Population Reports: Consumer Income*, February 7, 1949. Data for 1948 refer to the civilian population only and are the results of a sample survey. Persons not reporting industry in 1910 and 1940 have been distributed proportionately among all nonagricultural industries.

TABLE 2  
OCCUPATIONAL TRENDS, 1910-40, BY MAJOR OCCUPATION GROUP,\* IN PERCENTAGE  
OF ALL MALE WORKERS FOURTEEN YEARS OLD AND OVER  
(EXCEPT INEXPERIENCED)

GROUP	1910	1940
All workers	100.0	100.0
Professional persons	3.1	4.7
Farmers (owners and tenants)	19.9	13.0
Proprietors, managers, and officials		
Wholesale and retail	4.0	4.7
Others	3.9	4.4
Clerks and kindred workers	9.2	13.4
Skilled workers and foremen	14.5	15.2
Semiskilled workers	11.2	18.6
Unskilled workers		
Farm laborers	14.0	8.5
Laborers except farm	18.2	13.8
Servant classes	2.0	3.8

\* Alba M. Edwards' "social-economic" arrangement of the census occupational categories.

distinguish them from others without invidious implications, then the occupational structure can be conceived as segmented both horizontally and vertically. The first of these can be called strata and the second,

TABLE 3  
COMPARATIVE STRUCTURE OF THE EXPERIENCED MALE LABOR FORCE BY  
SITUSES, THE UNITED STATES, 1910 AND 1940

Situs	1910 Number	1940 Theoretical Number (based on 1910 distribu- tion)	1940 Observed Number	Observed Number as Per Cent of Theo- retical Number
Total	28,000	38,000	38,000	
Professional	760	1,030	1,600	155
Business and white collar	4,740	6,430	9,000	140
Amusement, recreation, and intellectual	160	215	320	149
Agricultural*				
Farm owners, tenants, and managers	5,710	7,750	5,110	66
Farm labor	2,430	3,300	2,240	68
	8,140	11,050	7,350	67
Manual				
Skilled mechanics	1,755	2,380	2,670	112
Construction trades	2,700	3,665	3,560	97
Outdoor work	1,955	2,650	3,050	115
Factory work	3,970	5,390	7,150	133
General labor	1,080	1,465	690	47
	11,460	15,555	17,120	110
Service				
"Official," community	360	490	770	157
"Unofficial," community	1,300	1,765	1,145	65
Personal	1,080	1,465	695	47
	2,740	3,720	2,610	70

\* Excluding unpaid family labor.

SOURCE: Sixteenth U. S. Census, *Comparative Occupation Statistics for the United States, 1870-1940*, Table 14.

situates. The particular situates used here are simply empirical products of a scale analysis of the N.O.R.C. occupational study; that is, they represent occupations which cluster together on some basis other than prestige. Little can be said of situates beyond the fact that people seem to think of them as groups of occupations. They do provide a series of vertical groups which, though they may correlate with status, are not gathered on this principle.

Table 3 presents a comparative analysis of the ways in which the



1910 and 1940 labor forces were distributed by *situses*. As we should expect, professional occupations show the greatest relative expansion, with intellectual, amusement, and recreational functions almost equally expanding. These facts underline the degree to which tertiary, quaternary, and quinary industries have become expressed in the occupational structure. It is significant to note, also, that when business and white-collar occupations are taken as a *situs*, their growth has likewise been great. The census category of proprietors, managers, and officials, it will be recalled, showed a growth less than that of the labor force as a whole, while the clerical, sales, and kindred workers grew rapidly. Perhaps because they include self-employers, census classifications seem to suggest a picture of downward movement, whereas if the total business world is viewed together, it is clear that such occupations, with their potential for mobility, actually provide evidence of a generally upward trend in prestige.

The agricultural *situs* has of course lost heavily but the net contribution of this change is hard to appraise. It can, however, be seen that both farm operators and farm laborers have contributed equally to the decline. Thus it cannot be said that the agricultural *situs* has declined by reason of the loss of farm operators as over against farm laborers. On the contrary, the increase in farm size and capitalization have undoubtedly functioned to raise the prestige level of the agricultural *situs* as a unit.

The manual occupational groups as a whole have increased somewhat, with factory employment and highly skilled trades other than construction leading the way. The construction trades (which seem to be lower in status for their skill level: carpenter 65 and plumber 63 versus machinist 73 and locomotive engineer 77, on the N.O.R.C. prestige scale) have shown a decrease, and general unskilled labor has been cut to less than half.

The service occupations as a whole show a great relative loss, but this again is for the lowest prestige jobs. "Official" community services, such as policemen, firemen, inspectors, and motormen, have actually shown a high rate of increase. It is the truly great losses in "unofficial" community services—deliverymen, gardeners, etc.—and the shrinkage of personal services which account for the over-all loss.

If then occupations are viewed not only from the standpoint of prestige but also from the standpoint of *situses*, it becomes clear that our occupational structure has moved far towards a more favorable distribution of socially desired and valued occupational positions.

These results may be encouraging in terms of the "American Creed," but an important question remains to be answered. Granted that the change in occupational structure has required widespread

intergenerational mobility, it still must be asked whether the possibility of free upward movement—apart from increase in the number of places available—has increased or decreased. Natalie Rogoff, analyzing data from Indianapolis for 1910 and 1940 and allowing for the change in occupational structure, finds that individual mobility has remained on about the same level for this entire period.<sup>6</sup> If Indianapolis is representative, it seems possible to conclude that the economic structure is neither widening internal status differences nor developing a more and more rigid structure.

Proceeding from observations of this sort and speculating upon future trends, what can be seen? It seems possible to discern two trends which for many years to come will continue to mold and change our class structure. First, the continuing growth of technology, which has cut our unskilled labor requirements by over 50 per cent in thirty years, will undoubtedly continue. If technology has moved labor from the farm and out of the unskilled class into the factory, it may go on to move labor out of the factory and into tertiary, quaternary, and quinary industries, raising the general level of living while simultaneously reducing internal invidious distinctions. Not everyone appraises the consequence of technological advance in the same way. A recent paper issued by the Council for Technological Advancement, entitled "Automatic Control and the Automatic Factory,"<sup>7</sup> was perceived in quite another fashion by the *Wall Street Journal*. Its November 28 article on the Council's bulletin was headed: "Robot Factories on Horizon; Piano Roll Blues Seen for Labor." Instead of the blues for labor, such a development may well be a song of hope—hope for employment at ever better kinds of work and for a fuller enjoyment of work. We have already seen unions in the position of criticizing particular managements in certain industries for not raising productivity faster, and we shall probably see more of it.

#### IV

*Educational Institutions Are Becoming Ever More Important in the Assignment of Prestige and Occupational Position in the United States.* And the level of education itself is developing both the needs and values associated with an expanding level of living while providing the human resources required to satisfy them.

The major changes in occupational composition of the labor force have involved important changes in methods of recruitment. It seems safe to assert that the traditional recruiting institution for the occupa-

<sup>6</sup> Natalie Rogoff, "Recent Trends in Urban Occupational Mobility," in Paul K. Hatt and Albert J. Reiss, Jr., *op. cit.*, pp. 406-420.

<sup>7</sup> C.T.A., Bulletin No. 6, November 24, 1952.

tional structure used to be the family. In the extreme case of feudalism, it was a question of being born base or noble; after the industrial revolution, of being born poor or wealthy. Today it seems that the role of education has, because of greater stress upon it for entry into desired occupations, done much to open the doors to achievement.

This point seems entirely consistent with the findings presented above. Situses showing the greatest increases in numbers were those

TABLE 4  
COMPARATIVE GROWTH OF SELECTED PROFESSIONS, THE UNITED STATES, 1910 TO 1940  
(100 = 1940 expectation based on 1910 proportions)

Author	379
College professor	326
Chemist	275
School teacher	169
Artist	163
Civil engineer	152
Dentist	136
Musician	131
Newspaperman	121
Lawyer	117
Architect	99
Clergyman	89
Physician	84
All professions	155

SOURCE: Sixteenth Census, *loc. cit.*

depending heavily upon education: the professions, the intellectual, artistic, and amusement fields, and the area of business employment. Within the latter group, it was also evident that those for whom family connections are presumably most important—proprietors, managers, and officials—have decreased, while the white-collar segment—whose qualifications are education—have increased. Table 4 shows that not all professions have grown at equal rates.

It can be seen at once that the great growth of the professions is not accounted for by the classical faculties of law, medicine, or theology, but is the product of the disciplines of sciences and the arts. The growing significance for our occupational structure of both advanced general and technical education seems clear. As tertiary, quaternary, and quinary industries continue to grow—both because of technical developments and because higher education increases demand for their services—the operation of educational institutions takes an ever more influential part in the process of social stratification.

## V

*Social Mobility and Economic Advancement Are Functions of Access to Education.* Certain Cassandras warn that the market for

college graduates is limited and the supply can easily be overproduced, driving down salary levels and creating unemployment among people trained for and expecting professional positions. The report of the President's Commission on Higher Education, which recommended both equalization and expansion of opportunity for college training, is the special target for these alarmists. Some go so far as to suggest that such equalization and expansion of opportunity will lead automatically to fascism, through the disaffection of frustrated professionals. The best moderate case for this point of view was presented by Seymour E. Harris in 1949 in *The Market for College Graduates*, but was foreshadowed from the sociological point of view in *Who Shall Be Educated?* by Warner, Havighurst, and Loeb in 1944. We cannot engage here in a detailed critique of those two books, but it appears to us to be better economics and better sociology to maintain the opposing point of view: to widen the channels to social mobility and economic advancement, through equalization and expansion of educational opportunity, is the surest means to maintain full employment and social harmony in our dynamic society.

Please regard our assertion of the corollaries to this proposition as epigrammatic rather than dogmatic or, better still, as hypotheses for verification by our continued collaboration:

1. Investment in the quinary industries—health, education, research, and recreation—has to be predominantly public investment. Thus the cry for reduction of taxes in order to increase the flow of risk capital may be quite ill-advised if economic growth become the criterion of fiscal policy. Rather taxation may need increasingly to be reconceived as public saving.

2. Investment in quinary industries offers the highest multiplier of any form of investment. This has already been recognized by industrial leaders with respect to research, and they are on the verge of recognizing its validity for education. We would predict its eventual recognition for the development of basic human resources through health and recreational programs. Economic analysis of high industrial society may show advancement to the thirty-hour week will contribute more to over-all productivity than would return to the sixty-hour week.

3. Further equalization of consumption may be found to contribute to further lifting of the general level of consumption. Or put another way, the once direct relation of social mobility and economic advancement has become an inverse relationship.

4. Because the formerly inverse relationship between social status and fertility is in process of becoming a direct relationship, the ability of families to pass on their status to offspring is being profoundly weakened. The most secure endowment of their children is not in cash

but in education—a very good investment even from the strictly cash point of view, as economists like Harold Clark and Milton Friedman have shown.

5. Finally, let us admit explicitly that it is employment of scientific research in the continual re-evaluation of public policy which has pushed us into our interdisciplinary endeavors. All around the world, economic advancement is being reconstrued, not as the providential expression of a natural order, but as the outcome of policy decisions. We pay tribute to those economists who have pioneered in this fundamental reconstruction of social thought. The sociologists of stratification have lagged somewhat but are catching up in order to work with them on the common problems of social mobility and economic advancement which still lie ahead of both disciplines. In theory we analyze and departmentalize; in practice we are one.



## DISCUSSION

MARY JEAN BOWMAN: These three papers present both a striking unanimity and a striking contrast.

The authors all come in the last analysis to focus upon long-term changes in economic life. In part we see reflected here the growing preoccupation with economic development. But beyond this new interest is the recent impact of sociology upon economics. Our received tradition in economics stemmed primarily from the abstraction of elements in the economic life of the Western nations in recent generations. Sociological theory, whether that stated in terms of values or the less subjectively oriented concepts of social organization and process, derives from broader cross-cultural comparisons. Economists have been forced to acknowledge that much of their analytical framework is of specific rather than generalized applicability and as a result they are virtually compelled to view problems of economic development and change as intertwined with other aspects of a social system.

Yet it is in their treatment of sociological theory that the three papers are most divergent. Our two sociologist visitors confined their theorizing to a relatively low level of abstraction. They were perhaps too courteous, seeking to communicate to us in our language, when they might have forced us to think harder by using their own dialect. By that choice, however, they spared us the latest fashions in sociological verbalizations and kept our attention more singly upon the problems and data. Messrs. Spengler and Gottlieb mounted the Parsonian steed, only to ride in opposite directions. Spengler has underlined the value orientation element in Parsons' approach. Gottlieb ignored this limitation in Parsons' conception of sociology to focus instead on the idea of the social system; he uses this as a point of departure for some independent conceptualizations.

Professor Spengler relates sociological value theory to economics with his usual sound and broad perspective, and I have no quarrel with his main conclusions. My criticisms are three:

First, though he speaks of value orientations as "part" of the noneconomic environment, Spengler seemingly agrees with Parsons in making value theory coterminous with sociological theory in general. In so doing he gives inadequate attention to the varying degrees of objectivity among sociological concepts. There are sociological constructs more closely tied to observations than are value orientations, and the latter in any event differ vastly in the ease with which their presence may be validated.

Second, I would have appreciated hearing what, if anything, in recent sociological value theory Spengler finds to promise a more successful application to economic problems. His succinct and lucid summary of the Cornell seminar presents mainly what has been common ground among other groups of sociologists. Since the kernel of Parsons' present statement of his views lies in what he terms "pattern variables," Professor Spengler might have come to grips with that scheme. Most important, does this approach promise a

more definite validation in application of value concepts to interpretations of economic history or to comparative analysis of economic systems?

Third, the contrasts as well as the similarities between modern sociological value theory and the recent work of Arrow and others on social welfare functions might have received attention. "Welfare economics" has been in part an instrumental discipline, in part a more precise formulation of certain social philosophies, and in part analysis of abstracted theoretical models in relation to specified social norms. In all these ways, welfare economics provides a small sector of data for sociological value theory. But the two approaches to values are not on the same footing, and their dissimilarity is not lessened by the generalization of theories of choice and of games to include noneconomic as well as economic components. Welfare economics and much of generalized choice theory contribute to social philosophy and, like all such contributions, both reflect and influence the development of all the social sciences. The usefulness of marginal analysis in economics, for example, has rested as much upon its relevance to social evaluation as upon anything else. Social philosophy links the social sciences even while one of them takes values and philosophies as its raw material.

Dr. Gottlieb's paper particularly interested me because of work I have recently done on social and economic typologies. His paper is full of good ideas. Particularly to the point is his discussion of the "historical dimensions" of ideal-type systems, the generation versus the diffusion of core features of such systems, and the historically hybrid versus the analytically idealized system, as well as his comments upon the relevance for "system" theory of boundary lines between economies or societies. His final case for broad system analysis is strong.

Yet when all this is said, one must admit that Gottlieb's paper never gets beyond being an introduction to a "theory of the economic system," and the relative clarity of writing and insights into broad conceptual problems manifested at the end of the paper are marred by the lengthy opening. Gottlieb reflects Parsonian influence, but he has missed the rigor of thought that makes Parsons' analysis significant. He criticizes "monistic" concepts of "the economic" or of "economic systems" on the one hand, while he objects to definitions in "omnibus and negative" terms on the other. These criticisms are partially valid, but Gottlieb fails to point up the fact that the demarkation of what is economic and of what constitutes an economic system may legitimately vary with the nature of the problems on which attention is centered.

On one level of analysis Parsons' approach is exceptionally clear and appropriate. He regards economics as, on the one hand, a field of study identified by a focus upon certain functions, and on the other hand, a science built around an "analytical conceptual scheme." As a social science, economics deals with "rational decision making and the consequences of these decisions within an institutionalized system of exchange relationships," and economic theory provides a theory of process insofar as rational decision making determines "prices and quantities in the system of exchange." Finally, Parsons holds that "the functional significance of the economic process for the social system . . . is a matter of its relevance to the allocation of facilities"—facili-

ties being what economists call resources. (The quotations are from his *Social System*, pages 548-550.)

Gottlieb implies that this definition is among those condemned as monistic because it assumes rationality and is narrowed upon the pricing system. His search for a broader base than Parsons' is appropriate to his topic of study, but he comes dangerously close to the "omnibus" approach in presenting his own solution.

The difficulty seems to arise from Gottlieb's inability to make up his mind whether he will identify the core of an economic system by its institutions or by its functions. Also, in an earlier version of his paper Gottlieb stressed the separateness of the economic system while in the published version he stresses that it is "assimilated to the social order." He never seems to realize that he can cut through these apparent dilemmas by clear-cut definition of the core of his conception of an economic system (for given purposes) without being too concerned to identify the boundary between economic and non-economic. But he can never attain such an objective by hanging his definition upon the prior identification of core institutions that are envisaged (as are those he lists) in essentially empirical terms without primary conceptually integrative abstractions. The use of ideal types does not require, as he seems to think, that the core of a system be determined by first identifying institutions.

Actually, Gottlieb has taken two major steps in the right direction by fixing upon ideal types and the identification of major functions as among the essentials in marking out economic systems. (Incidentally, this concept of function as inseparable from structure is not as new as some social science faddists would imply.) But here he runs into trouble because he fails to appreciate the key role "functions" could play in his conceptualization. His list of relevant functions is unsystematic, and the later "nuclear formations of culturally impregnated interactive behavior patterns" or "basic economic institutions" are neither comparable among themselves nor systematically related to the functions by which an economic system is to be identified. Perhaps he has tried too hard. I have found the simple and obvious list of economic functions that I used in developing Part I of *Economic Analysis and Public Policy* (and which are a key to the whole book) to be equally helpful in more intricate problems of comparative economics. Gottlieb's insights bear less return than they should because, I suspect, the adhesion of institutionalist thought-ways has impeded the logical structuring of concepts.

Professors Foote and Hatt have organized their discussion around "five positive propositions" that are essentially empirical. These propositions sum up many types of change in our social and economic structure and are of interest on that account even without other considerations. However, it is rather to the broader theoretical implications they suggest that I shall devote my brief remaining time.

These authors use Colin Clark's data to attack what they term the "dogma" that "social stratification is the inevitable consequence of functional differentiation." This reservation I accept. But it seems quite another thing to assert that "general economic advancement and social equalitarianism are

interdependent, while retention of steep stratification and rivalrous personal mobility is economically stultifying." In the first place, this is not one thesis but two; there is no necessary connection between the two halves of the statement. I find their treatment of the relations between mobility and degree of stratification quite confusing. In the second place, they seem to assume that the underlying relation between stratification and economic advancement is a fundamentally simple one. I suspect that instead this association is a product of a number of relatively independent variables and may not be monotonic. Their contribution in raising the problem becomes clearer if we restate it as a double question: what, if any, necessary relationship exists between advancement and stratification; and what is the range of freedom for independent variation in these two phenomena? Foote and Hatt serve us well in pointing to the need for collaboration between economists and sociologists in attacking this problem.

Their paper facilitates further work along these lines by suggesting, first, how we may improve empirical classifications as a means to more effective analysis. In supporting their suggestions they have come more than halfway to meet the economists, though they are handicapped by the fact that much of the relevant economic theory of the dynamics of interrelations among income distribution, national income, employment, and capital accumulation is difficult, new, and still hotly debated among economists themselves.

Nevertheless, we would do well to ponder their suggestions for splitting Clark's tertiary category. Such a split seems essential if the analytical potentialities of the data are to be exploited. I wonder whether it might be preferable to shift their tertiary to the quinary position and possibly to split domestic service off as a distinctive category.

The second main contribution they make is to single out some defects in the sociological constructs that must form a foundation for analysis of stratification over time and in different societies. They put their finger on very real problems, though they are overly modest in telling us what sociology has to offer—including their own work. And there are perhaps more exceptions than they indicate. For example, in at least one case—a recent paper on which I collaborated (published in the June, 1952, issue of the *Journal of Political Economy*)—there is a careful statistical treatment of the distinction between general shifts in the distribution of occupations and certain facets of vertical mobility.

The confusion I have sensed in the treatment of relations between mobility and stratification (revealed in the unconsciously double thesis I have already cited) is in fact matched in their references to general upgrading versus equalization. For example, they make the following statement: "Consider simply changes of occupation during the career of a single individual: the effect of general economic advancement, whether measured by occupational development or real income, must be subtracted from his total movement to ascertain whether he has risen at all in the social scale."

Taken literally this statement would imply that the status scale must be such that distribution of the population along it will be always the same—a proposition that denies by definition the very existence of the hypothesis that

forms the unifying thread of their paper. Through much of the rest of the paper this is flatly contradicted. The authors skirt around the "social distance" idea but seem carefully to avoid meeting it face to face.

In summary, the defects of this paper stem from the fact that Professors Foote and Hatt have been too reluctant to force us as economists to come to grips with some relatively technical issues in sociology. However defective present concepts of social distance may be, it seems beyond question that social distance or related concepts must be sharpened or refined as means to stratification analysis before basic questions can be framed with sufficient clarity to make their analysis and testing by empirical observations possible. Certainly some attention is due the proposition that the degree of stratification is reflected in the extent to which various factors of invidious social differentiation are conjoined. And in part overlapping with this problem is the conceptual question of the relevance of mobility to what constitutes a system of stratification and what is meant by "degree of" stratification. The best of data cannot resolve this problem on the conceptual level.



## RECENT DEVELOPMENTS IN MATHEMATICAL ECONOMICS AND ECONOMETRICS: AN EXPOSITORY SESSION

### CARDINAL UTILITY<sup>1</sup>

By ROBERT H. STROTZ  
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This paper is concerned with the recent revival of the proposition that utility is measurable. This is an old issue and one on which our opinion has been largely reversed during the past few years. Initially we accepted the concept of utility as measurable, then we rejected it, and now we are in the process of accepting it again.

Utility was originally conceived as a psychic quantity, which, while it may not have been easily measured, was regarded as measurable, at least in principle. The notion of the diminishing marginal rate of utility came quite naturally for it appears to have had considerable appeal to one's intuition. Although the acceptance of a cardinal utility of this sort had been questioned earlier, that doctrine was not effectively interred until 1934, largely as a consequence of the work of Allen and Hicks. ("A Reconsideration of the Theory of Value," *Economica*, February, May, 1934.) Utility then came to be regarded as an ordinal sort of thing, subject to ranking but not to measurement. The principle of Occam's Razor lent sanctity to the new approach because it was found that ordinal utility served very well for the treatment of the problems to which utility theory was conventionally applied. The assumption of the cardinal, quantitative character of utility, doubtful and unneeded, was largely abandoned. The word utility persisted in our literature, however, but only as an indicator enabling us to say that if a consumer prefers *A* to *B* to *C* he derives greater utility from *A* than from *B* or *C* and greater utility from *B* than from *C*. But we denied that any meaningful statements could be made about whether the difference in the utilities provided by *A* and *B* is greater or less than the difference in the utilities provided by *B* and *C*. Utilities could be compared but differences between utilities could not.

This paved the way for a behavioristic rather than a hedonistic interpretation of utility. Utility no longer had to be thought of as a psychological entity measurable in its own right. It could now be

<sup>1</sup> This paper will be included in *Cowles Commission Paper*, "New Series," No. 75.

regarded as simply a convenient label for the explicit value of a function which described consumer behavior. The definition of a utility that consumers maximized had become tautologous. The utility function was simply any function that was maximized and the empirical significance of the theory of consumer behavior resided in the qualitative restrictions that were imposed on the form of the utility function itself, notably by the requirement of the diminishing marginal rate of substitution. Professor Stigler could write in his *Theory of Competitive Price*: "It does not affect the formal theory of demand in the least whether the individual maximizes wealth, religious piety, the annihilation of crooners, or his waistline." (Page 64.) This statement clearly requires that no judgment be made as to whether utility be measured in dollars or in days indulgence, in octaves or in inches, and there certainly is no presumption that utility is to be measured in some psychological unit.

In 1945, however, with the publication of the *Theory of Games and Economic Behavior*, by von Neumann and Morgenstern (second edition, Chapter III and Appendix), measurable utility was resurrected, but only as a result, it should be understood, of a quite different and superior understanding of the meaning of measurement. Measurable utility in the von Neumann-Morgenstern sense bears little resemblance to the measurable utility that was discarded during the past two decades. During the interregnum from Allen and Hicks to von Neumann and Morgenstern such debate as existed between the vanishing cardinalists and the ascendant ordinalists was concerned essentially with the philosophical question of whether cardinality or quantifiability could reasonably be regarded as an intrinsic property of the entity called utility.<sup>2</sup> From the modern point of view, we now realize that this philosophical question of whether utility is intrinsically measurable is a spurious one and that measurement has meaning, not as a property of things, but as a predictive procedure. Crucial to an understanding of this entire subject is the realization that measurement is always invented and never discovered!

Consider for a moment the question of measuring length. Suppose that there are two carpenters each of whom has the task of placing two boards end to end and then sawing a third board that will exactly cover the combined length of the first two. The first carpenter proceeds as we would. He measures the length of a board by counting

<sup>2</sup> This appears to be the case, for example, in O. Lange, "The Determinateness of the Utility Function," *Review of Economic Studies*, June, 1934; W. E. Armstrong, "The Determinateness of the Utility Function," *Economic Journal*, September, 1939; F. H. Knight, "Realism and Relevance in the Theory of Demand," *Journal of Political Economy*, December, 1944; and, more recently, D. H. Robertson, "Utility and All That," *Manchester School*, May, 1951.

the number of times he can lay down on it, end to end, a rule of unit length, where the unit is arbitrarily defined. If the rule can be placed end to end three times on the first board, he declares that board to be three rule-lengths, or, let us say, 3 feet long. Now this statement is arbitrary. He might just as well have said that the length of the board is the-square-root-of-three feet long or the-square-of-three feet long or any-other-function-of-three feet long. But his convention is a useful one, especially for the problem at hand. Finding the first board to be 3 feet long and the second board to be 4 feet long, he knows that the board to be cut must be  $3 + 4$  or 7 feet long. He need only know how to add to make a good prediction.

The second carpenter, having been apprenticed in a strange land, measures the first board in a different manner. His measure is the square of our measure. When he lays the rule down again and again he counts "1, 4, 9" and declares the board to be 9 feet long. The second board is measured by counting "1, 4, 9, 16." To determine then how long a board he should cut, he calculates  $(\sqrt{9} + \sqrt{16})^2 = 49$ , and so measures off a length of 49 counting "1, 4, 9, 16, 25, 36, 49." Forty-nine being the square of 7, his answer is really the same as that of the first carpenter. The method of the second carpenter requires somewhat better knowledge of arithmetic than the method of the first, as he must square a sum of square roots rather than simply add. But his method is not incorrect; it is simply awkward.

Suppose now that these two carpenters were given another assignment. This time they are to place the first two boards at right angles and saw a third board to form the hypotenuse of a right triangle. The first carpenter performs the calculation  $\sqrt{3^2 + 4^2} = 5$ ; the second carpenter,  $9 + 16 = 25$ . Twenty-five being the square of 5, both methods are correct, but this time it is the method of the first carpenter which is awkward. In short, one method of measurement may be more convenient than another for some purposes and less convenient for other purposes. A vast variety of methods may, however, all be correct.

Why do we customarily use the measure of the first carpenter rather than that of the second? I suppose the answer is that we more commonly encounter problems of placing lengths end to end than problems of constructing right triangles. But the important point is this: our choice of a measure is largely a matter of convenience or manageability.

An equally important point, of course, is that a measure which makes computation convenient must also work. If, for example, we found that although a board 7 feet long exactly covers the combined length of one 3 feet long and one 4 feet long, a board 70 feet long

exceeds the combined length of boards 30 and 40 feet long, then the particular formula we use, namely, simple addition, would be incorrect and unsatisfactory. In short, what we want is to invent some arbitrary method of measuring things which, coupled with a simple formula, will enable us to make correct predictions.

Now the very same thing is true of utility. We want to find an arbitrary measure of utility so that we can under frequently encountered conditions predict consumer behavior by use of a simple formula.

An early example of this approach is to be found in Samuelson's essay entitled, "Constancy of the Marginal Utility of Income" (in O. Lange *et al.*, *Studies in Mathematical Economics and Econometrics*). Here the following problem was raised.

Marshall found that a good deal of the analysis of consumer behavior could be greatly simplified by assuming that the marginal utility of income is constant. Now, the marginal utility of income is clearly a measure. Could we then invent a measure of utility so that the marginal utility of income would in fact be constant?

If so, we should then want to determine whether this measure would imply anything about reality that we might put to test, and, if there are any empirically testable theorems implicit in our acceptance of this measure, we should then want to know whether these theorems correspond to reality. Before pursuing the question of whether we can invent an acceptable measure of utility for which the marginal utility of income is constant, we must note, as Samuelson has pointed out, that the phrase, "the constancy of the marginal utility of income," is subject to diverse interpretations. For our illustrative purpose here, we propose the following particular interpretation. By "the marginal utility of income" let us mean the common value of the ratios of the marginal utilities of commodities to their prices. By "constancy" let us mean constancy with respect to independent changes in the various prices of commodities and in income. Now, we may see clearly what our problem is. As is well known, there is an infinite number of utility functions that will serve equally well to describe the behavior of a given individual. This is so because for any one of these functions that will describe his behavior any other function that increases, decreases, or stays the same whenever the first one increases, decreases, or stays the same will describe the consumer's behavior just as well.

Two functions which are related in this way are called "monotonically increasing functions of each other." The reason why any member of this family of monotonically increasing functions may be selected as the utility function is because a consumer who may be said to maximize any one of them subject to his budget may be said to maximize any other for they all go up and down together. Can we find among this

infinite number of acceptable utility functions one that has the property that the marginal utility of income will remain constant for a change in any price or for a change in income? If so, we can define a measure of utility (that is, we can select this particular utility function) so that it is permissible to assume that the marginal utility of income is constant. What Samuelson then proceeded to show is that no such function is available. (This is analagous to showing that for no measure of length will the third side of a triangle, which is not necessarily a right triangle, be equal to the sum of the other two sides.)

Let us next change the problem a bit by changing our definition of constant to mean constant with respect to a change in any commodity price, although not constant with respect to a change in income. In answer to this problem Samuelson showed that a total utility function might be specified so that the marginal utility of income is constant in this sense. But he found, moreover, that there is an empirically testable proposition implicit in the acceptance of such a total utility function; namely, that the income elasticity of the demand for each commodity is unitary. This, clearly, does not square with the facts. To summarize, the question was whether a measure of total utility could be devised so that the marginal utility of income would be constant with respect to price changes. What was shown was that any measure that would satisfy this condition would entail the empirical restriction that income elasticities be unitary. Since income elasticities are not all unitary, we conclude that no such measure can be defined.

Just as it suits the Marshallian demand analysis to assume a total utility function for which the marginal utility of income is constant, so von Neumann and Morgenstern also had a purpose in assuming the existence of a total utility function with a convenient property. Dealing to a considerable extent in their *Theory of Games* with choices in situations involving risk, they found that it would be quite helpful to have a utility function that would make possible the use of a simple formula to describe an individual's choices among various risks. How nice it would be to say that every gamble can be reduced to a certainty equivalent, where the certainty equivalent would be that certain income (increment of income) which provides a utility equal to a weighted average of the utilities resulting from different possible outcomes of the gamble, the weights being probabilities. For example, it would be convenient if we could say that an individual would evaluate a  $1/5$  to  $4/5$  chance of winning either \$0 or \$10 as follows: If he in fact wins nothing his utility will be, say, 0; if he in fact wins \$10 his utility will be, say, 1. The weighted average utility will therefore be  $1/5 \cdot 0 + 4/5 \cdot 1 = 4/5$ .

Now, we should like to continue, the individual will be indifferent between this particular gamble and any other gamble that provides a



weighted average utility of  $4/5$  and he will be indifferent between this class of gambles and any certain awards that provide the same utility. The weighted average is known as his mathematical expectation of utility or, in Bernoulli's terms, his moral expectation. It is to be distinguished from the utility of the mathematical expectation of his winnings which would be the utility of the weighted average of the possible winnings; that is, the utility of  $1/5 \cdot \$0 + 4/5 \cdot \$10$  or the utility of \$8. We can make this distinction in more familiar terms. The mathematical expectation of utility or moral expectation we might call simply the "average utility of the winnings" or just "average utility." The utility of the mathematical expectation of the winnings we shall call the "utility of the average winnings."

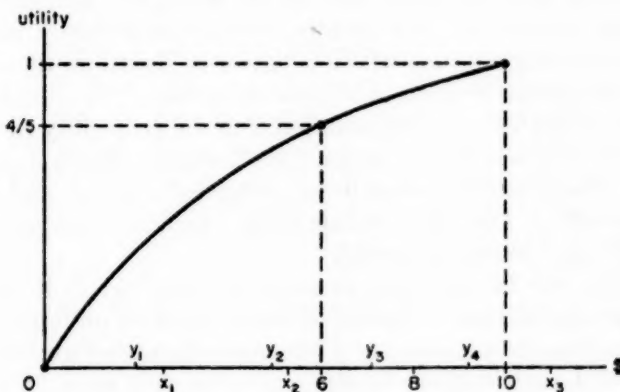


FIGURE 1

Suppose the individual prefers the certainty of \$8 to the  $1/5$ - $4/5$  chance of nothing or \$10. The utility of the average winnings is then greater than the average utility of the winnings. Suppose, however, that he is indifferent between the gamble and the certainty of \$6. The utility of \$6 is then equal to his average utility from the gamble, which is  $4/5$ .

This defines three points on a utility curve (Figure 1): for zero income, zero utility; for \$10 income, 1 unit of utility; and for \$6 income,  $4/5$  of a unit of utility. The first two points are arbitrarily defined; the last is obtained by finding the certain income which is equivalent to the gamble, the utility of which has been computed to be the weighted average utility of the possible outcomes.

By varying the probabilities in the gamble and setting the average utility which we can compute equal to the utility of the certain payment to which the individual is indifferent (the certainty equivalent) his entire utility curve can be constructed between \$0 and \$10, and by the same general method the curve can be extended still further. Such

a curve is a Neumann-Morgenstern utility function. There are, of course, many such functions but they differ one from another only in the choice of a unit of measurement and the location of zero. They are all related to one another in the same way that the centigrade thermometer is related to the Fahrenheit thermometer.

Once we have constructed a Neumann-Morgenstern utility function it should, to be useful, enable us to answer all possible questions we can put to it about the choice that an individual would make among various gambles offered to him. If, for example, an individual had a choice between a gamble in which he might win any one of the amounts  $x_1, x_2, x_3$  with various probabilities and a gamble in which he might win any one of the amounts  $y_1, y_2, y_3, y_4$  with various probabilities, it should follow that he will choose the gamble for which the average utility of the possible outcomes is the greater. Now, it is certainly conceivable that we might find someone whose behavior in situations involving risk could not be predicted from this function by use of the simple formula of average utility or moral expectation. But the possibility that we may not be able to make correct predictions indicates simply that the von Neumann-Morgenstern postulate has empirical content and is not an empty formalism. For the postulate to be significant, one must run the risk that it might be proved wrong.

What does our intuition tell us about this matter? Is it self-evident that people who are not pathological will order their preferences among gambles so that the existence of a Neumann-Morgenstern function will be assured? I am afraid my intuition tells me very little. It is not self-evident to me that this function either does exist or does not exist.

What then can be done to answer this question? We may move in either of two directions: First, we may replace the hypothesis that there exists a Neumann-Morgenstern utility function with an axiomatic system that implies this statement as a theorem. That is, we may seek a set of statements (axioms) which are logically equivalent to the statement that a Neumann-Morgenstern utility function exists. The existence of this function is then a theorem which can be logically derived from these axioms. The purpose of finding such axioms which really say the same thing as the theorem is that it may be easier for our rather opaque intuition to accept or reject the axioms than to accept or reject the theorem itself. A Supreme Being would have no need for axioms, but they are often found quite useful for mere men. Von Neumann and Morgenstern have provided us with an axiomatic system for their utility measure as have several other writers.<sup>3</sup> Let me sketch one of these systems, that of

<sup>3</sup>Notably Jacob Marschak, "Rational Behavior, Uncertain Prospects, and Measurable Utility," *Econometrica*, April, 1950; I. N. Herstein and John Milnor, "An Axiomatic Approach to Measurable Utility," *Econometrica*, forthcoming.

Professor Marschak, in a rather carefree fashion to indicate the main idea.

Marschak's axioms or postulates are as follows:

1. An individual's preferences are completely ordered. Any two "prospects," be they gambles or certainties, can be compared in the sense that one will be either preferred or indifferent to the other. Furthermore, the ranking of prospects is transitive, which means that if  $A$  is preferred to  $B$  and  $B$  preferred to  $C$ ,  $A$  is preferred to  $C$ .

2. If  $A$  is preferred to  $B$  and  $B$  to  $C$ , then there exists a probability  $p$  between 0 and 1 such that the gamble  $A$  with probability  $p$  and  $C$  with probability  $1 - p$ , which we shall represent as  $[pA + (1 - p)C]$ , will be indifferent to  $B$ . This means that some probability combination of something better and something worse can be found to make such a gamble indifferent to something in between.

3. For any object of choice or "prospect"  $A$  and for any probability  $p$  (between 0 and 1) one can specify another prospect  $B$  such that  $A$  will not be indifferent to the probability combination  $[pA + (1 - p)B]$ . That is to say, for example, that if  $A$  is \$10 and  $p$  is  $\frac{1}{2}$ , one can find a sum of money such that a fifty-fifty chance of \$10 or that other sum is either better or worse than \$10. The real significance of this is that a gamble in which the probability of a given prospect of  $A$  is not 1, however close to 1 it may be, cannot always be regarded as equivalent to the certainty of  $A$ .

4. If  $A$  and  $B$  are indifferent and  $p$  is between 0 and 1, then for any prospect  $C$ ,  $[pA + (1 - p)C]$  is indifferent to  $[pB + (1 - p)C]$ . This has caused some confusion because of the possibility that  $B$  and  $C$  may be more complementary than are  $A$  and  $C$  so that one would prefer to have  $B$  and  $C$  to having  $A$  and  $C$ . This complementarity is irrelevant, however, because in a gamble of the sort considered one gets either one outcome or the other, but not both.

These axioms have strong intuitive appeal. It would seem that every normal person would clearly accept them as precepts of behavior. Now, Marschak shows that these axioms are just another way of saying that a Neumann-Morgenstern utility function exists. If you accept the axioms you are then logically required to accept the Neumann-Morgenstern theorem which can be derived from them.

Earlier I said that resort to the use of axioms is one of two methods of considering the validity of the Neumann-Morgenstern hypothesis. Another way is to find some concrete choice situations where the violation of the Neumann-Morgenstern hypothesis seems plausible or is actually revealed by observation. The following case will illustrate what I mean.

Suppose an individual is confronted with choices among these alternatives:

$$A = (\$0, p = 1)$$

$$B = (\$5, p = 1)$$

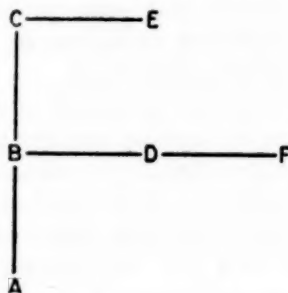
$$C = (\$10, p = 1)$$

$$D = (\frac{1}{2} \cdot \$0 + \frac{1}{2} \cdot \$10)$$

$$E = (\frac{1}{2} \cdot \$0 + \frac{1}{2} \cdot \$20)$$

$$F = (\frac{2}{3} \cdot \$0 + \frac{1}{3} \cdot \$25)$$

and that he orders these alternatives as follows, where a letter higher on the page is preferred to one that is lower.



Is there anything preposterous or pathological about a person arranging his preferences in this way? Are we prepared to say that such a person would hardly be found walking the streets? I am not myself prepared to say this.

Suppose now we attempt to construct a Neumann-Morgenstern utility function for this person (Figure 2). Let the utility of *A* be 0 and the utility of *B* be 1. Then the utility of \$10 must be 2 because *D*

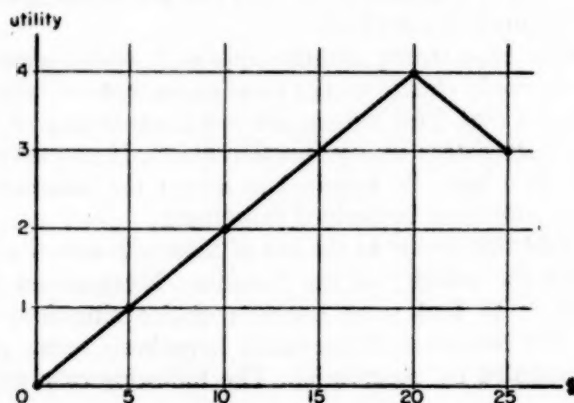


FIGURE 2

is indifferent to  $B$ . The utility of \$20 must be 4 because  $E$  is indifferent to  $C$ . The utility of \$25 must then be 3 because  $F$  is indifferent to  $B$ . But this says that the utility of \$25 is less than the utility of \$20, which is an absurdity.

Is there something unbelievable about this person's preferences or is there something unrealistic about the Neumann-Morgenstern hypothesis? This much we can note. Because  $E$  is indifferent to  $C$  and because  $C$  enters into the probability combination  $D$ , we may substitute  $E$  for  $C$  (\$10) in  $D$ . This describes a new prospect  $D' = [\frac{1}{2} \cdot 0 + \frac{1}{2} (\frac{1}{2} \cdot \$0 + \frac{1}{2} \cdot \$20)]$  which is a fifty-fifty chance of winning nothing or of winning a lottery ticket which provides in turn a fifty-fifty chance of winning nothing or of winning \$20. Using Marschak's fourth axiom,  $D'$  is then indifferent to  $D$ . Now  $D'$  may be written more simply as  $[\frac{3}{4} \cdot \$0 + \frac{1}{4} \cdot \$20]$ . Transitivity requires that since  $D'$  is indifferent to  $D$  and  $D$  is indifferent to  $F$ ,  $D'$  must be indifferent to  $F$ . But this means that the individual does not prefer  $F$  to  $D'$  or does not prefer having the amount to be won increased from \$20 to \$25 simultaneously with an increase of the probability of winning from  $\frac{1}{4}$  to  $\frac{1}{2}$ . In other words,  $F$  differs from  $D'$  only by offering a higher probability of winning more.  $F$  would, therefore, clearly be preferred to  $D'$ . The conclusion from the axioms that  $F$  and  $D'$  are indifferent therefore involves us in a contradiction.

Is there something irrational about a man's holding these preferences and contradicting the axioms of choice which we reviewed a bit ago? The rationality of these axioms seemed self-evident, but we ought now explain just what the meaning of rational is. A test for the propriety of using the word rational here is the following. Consider any person not deemed insane who holds contradictory preferences such as those illustrated here. Imagine that we explain to this person the nature of the contradiction, pointing out clearly how his preferences violate our axioms. Will he in consequence of understanding the nature of the contradiction decide that his preferences are ill-founded and proceed to change them, or will he persist in his original preferences even though it is entirely clear to him exactly what precepts his preferences violate. If for nearly every person holding contradictory preferences an understanding of the character of the contradiction induces him to straighten out his preferences, then the Neumann-Morgenstern axioms may properly be regarded as precepts of rational choice. My own feeling is that it would be a strange man indeed who would persist in violating these precepts once he understood clearly in what way he was violating them.

But to conclude that the Neumann-Morgenstern hypothesis provides a principle of rational behavior is not to conclude that it is empirically valid. My own casual impression of human nature does not permit me



to deny a priori the existence of contradictory choice structures. Even after accepting the Neumann-Morgenstern principle as a rational one, choice among risks may not be an easy thing for an untutored man to keep straight and self-contradictory preferences like faulty arithmetic may not be uncommon. This is, of course, an empirical question and one might hope that future empirical work will shed some light on this subject. I should not want to prejudge the final answer. To emphasize the possibility that the Neumann-Morgenstern theory may be an incorrect generalization about reality is, of course, also to empha-

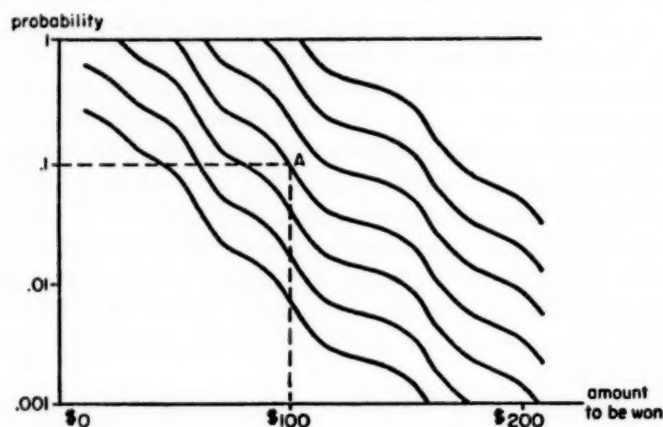


FIGURE 3

size that it is a meaningful proposition that has something to say about reality.

Here is an interesting way to illustrate the fact that the Neumann-Morgenstern hypothesis has empirical content. Consider all possible risks which entail only some probability of winning some single amount of money. Any such risk may be represented by a point on the graph (Figure 3) where the amount to be won is measured horizontally and the probability of winning that amount is measured vertically along a logarithmic axis. For example, *A* is a gamble offering a 1/10 chance of winning \$100. Consider now the indifference curves of an individual among these various gambles. (The probability of winning may be regarded as one commodity and the amount to be won as another). If the individual is rational according to the Neumann-Morgenstern axioms, these indifference curves will all be vertical displacements of one another, as drawn. This may be demonstrated as follows: Consider any two indifference curves such as those shown in Figure 4 and lottery tickets  $A = (p_a \cdot x_a)$  and  $B = (1 \cdot x_a)$ , and any  $C = (p_c \cdot x_c)$  which is indifferent to  $B$ . To establish that the indifference curves are vertical displacements of one another we need only show line  $DC = AB$ . Since

$A$  is the probability  $p_a$  of winning  $x_a$  and  $B$  the certainty of  $x_a$  we may substitute the "sure" ticket  $B$  for  $x_a$  in ticket  $A$ .  $A$  can therefore be regarded as a lottery ticket offering the probability  $p_a$  of winning the "sure" ticket  $B$ ; i.e.,  $A = [p_a \cdot (1 \cdot x_a)]$ . Using the fourth of Marschak's axioms we may substitute  $C$  for  $B$  in  $A$  because  $C$  and  $B$  are indifferent. This defines a new lottery ticket

$$D = [p_a \cdot (p_c \cdot x_c)] = (p_a p_c \cdot x_c) = (p_d \cdot x_c)$$

which is indifferent to  $A$ . We must now show  $\ln p_c - \ln p_d = \ln 1 - \ln$

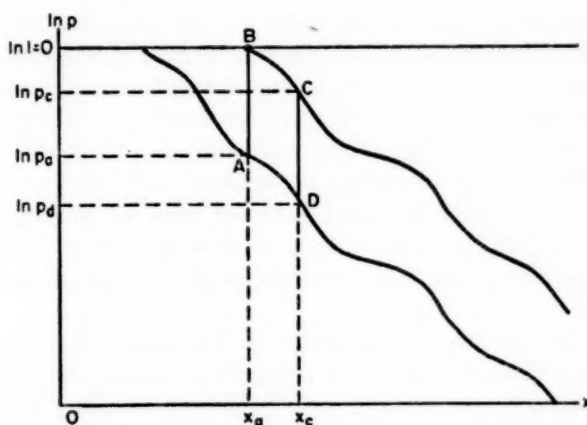


FIGURE 4

$p_a$ . Since  $\ln p_d = \ln p_a + \ln p_c$  and  $\ln 1 = 0$ , this is straightforward. Therefore,  $DC = AB$ , as required. Another way of stating this is that the marginal rate of substitution between the logarithm of probability and the amount to be won must be independent of the probability.

There are several further aspects of the topic being discussed here and only a few of them can yet be considered even briefly.

One question concerns the extent to which the "love of gambling" has been ignored by the theory. The "love of gambling" as a "love of danger" is clearly ruled out as behavior inconsistent with the theory (Marschak, *op. cit.*, pages 138, 139). Neumann-Morgenstern people do not play Russian Roulette. They may or may not commit suicide but they certainly do not prefer a 1/6 probability of death to either the impossibility or the certainty of death. The cylinders of their revolvers are either completely empty or fully loaded. The attraction of gambling which derives from the pleasure of the game, the spinning of the wheel, the bouncing of the dice, the party—these things are either abstracted from or included as part of the pay off. But the desire to gamble, even when gambling is dull, is not excluded. It is, as a matter of fact, one of the main things that the theory is about. The person

who takes the dull gamble with a negative expected return is said to gamble because of increasing marginal utility which means that he finds the average utility of the possible outcomes to exceed the utility of the average outcome. It is a major contribution of the theory that it provides a hypothesis to explain this.

A related point refers to the fascinating psychological experiments conducted by Ward Edwards, of Johns Hopkins, in a paper entitled, "Experiments in Economic Decision-Making in Gambling Situations" (presented at the September, 1952, meetings of the Econometric Society). Edwards observed the preferences of subjects among various lottery tickets and found that he could explain their choices very neatly (in my opinion, more neatly than the von Neumann-Morgenstern utility function could explain them) in terms of assumed preferences for certain probabilities and dislikes of other probabilities. His subjects seem to have been attracted by certain probabilities and repelled by others independently of the winnings associated with them. Only small amounts of money were involved, however, and the probability preferences he found may well have been inconsequential and overpowered by Neumann-Morgenstern considerations had larger amounts been at stake.

Granted the existence of a Neumann-Morgenstern utility function, we have only found a particular measure of utility that proves to be highly manageable for dealing with problems of risk. We have in no way denied that other utility functions which are not Neumann-Morgenstern functions may just as correctly be defined. If  $U_1$  in Figure 5 is a Neumann-Morgenstern function in terms of which we can predict a person's choices, then  $U_2$ , which is not a Neumann-Morgenstern function but which increases monotonically with  $U_1$ , will be equally correct. It will simply be more cumbersome in making the same predictions. This everyone has come to recognize, especially since William Baumol's note which insisted on the point ("The Neumann-Morgenstern Utility Index—An Ordinalist View," *Journal of Political Economy*, February, 1951). This means we have not reverted to the concept of a unique measure of utility in the sense in which cardinal utility was originally conceived. The behavioristic definition of utility as the value of any function the individual may be said to maximize has not been scuttled for the earlier, hedonistic concept of utility as a psychological quantity. The measure of utility provided by von Neumann and Morgenstern cannot therefore rehabilitate the utilitarian brand of welfare economics which requires the maximization of some scalar function of the cardinal utilities of the individuals in a society. For welfare economics there is no more reason to accept  $U_1$  than to accept  $U_2$ .

Furthermore, the acceptance of the von Neumann-Morgenstern measure does not preclude the definition of still other measures. It is true that the von Neumann-Morgenstern measure is convenient and manageable for the class of problems involving risk, but it need not prove convenient for all classes of utility problems that may conceivably arise. Nothing rules out the usefulness of another measure for another purpose. And certainly no hypotheses about measurable utility can rebut the merits of the ordinal, indifference curve analysis of consumer

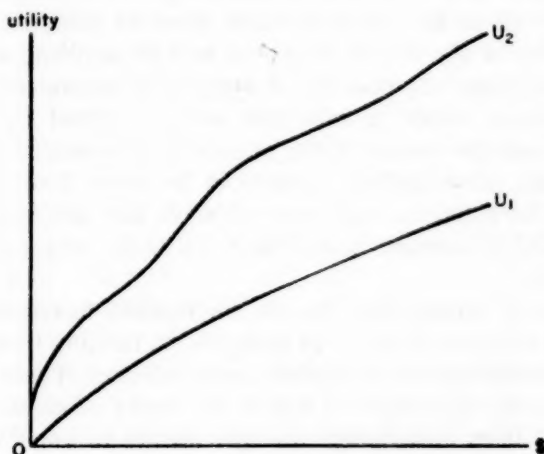


FIGURE 5

behavior under certainty which seems to require the definition of no particular measure and which therefore does not impose unnecessary further restrictions on the nature of reality.

I should not want these final cautions concerning the use of the Neumann-Morgenstern measure to detract from the significance of this subject. Von Neumann and Morgenstern have given us an empirically meaningful and provocative hypothesis about economic behavior that may contribute substantially to a broad area of economic analysis. They have also straightened out the thinking of economists about the meaning of measurement and cleared aside the major misunderstanding that hampered the earlier disputations of cardinalists and ordinalists.<sup>4</sup>

<sup>4</sup>The reader who is interested in reading further on this subject is referred to the references already cited and in addition to J. Marschak, "Why 'Should' Statisticians and Businessmen Maximize Moral Expectation?" in J. Neyman, ed., *Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability*, 1951; Milton Friedman and L. J. Savage, "The Utility Analysis of Choices Involving Risk," *Journal of Political Economy*, August, 1948; Frederick Mosteller and Philip Nogee, "An Experimental Measurement of Utility," *Journal of Political Economy*, October, 1951; and Milton Friedman and L. J. Savage, "The Expected-Utility Hypothesis and the Measurability of Utility," *Journal of Political Economy*, December, 1952.

## WHAT HAS HAPPENED TO THE THEORY OF GAMES

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Since the publication in 1944 of the first edition of the by now classic *Theory of Games and Economic Behavior* by von Neumann and Morgenstern (1)<sup>1</sup> there has been a minor flood of contributions to the various aspects of the theory of games and its applications; a recent book by McKinsey (2) provides a systematic treatment of some of the developments, while a collective volume edited by Kuhn and Tucker (3) indicates some of the directions of research in this field. Other valuable contributions, scattered in many journals, are too numerous to be listed or even referred to in this brief survey, but it may be helpful to mention that 2 and 3 contain very comprehensive bibliographies.

The theory of games thus has an undisputed fascination for, and a stimulating effect on, workers in many fields, ranging from (comparatively) pure mathematics to applied social sciences. There is a natural curiosity as to the directions in which the theory of games and its application have been developing; one also wishes to know which of the developments have found widespread agreement as against those which still are controversial. The limited scope and nontechnical nature of the present exposition can do little more than give a very sketchy indication of the nature of these developments.

The problems of the theory of games are characterized by the presence of two types of issues: the nature of individual behavior in situations involving (non-probabilistic) uncertainty; and the interactions in the behavior of individuals when everyone's action may affect the well-being of others. Since both of these present difficulties of their own, we shall start by discussing problems in which only issues of the first type are present.

### *Individual Behavior Under Uncertainty*

There is no doubt that this type of problem is of great importance to the economist (e.g., in the study of investment decisions) and has been receiving in recent years an increasing amount of attention. One might question, however, the relationship of this problem to the theory of games. The answer is twofold. First, the problem of individual decision

<sup>1</sup> Numbers in italics refer to the list of sources cited, placed at the end of the paper. This paper will be included in *Cowles Commission Paper*, "New Series," No. 75.



making under uncertainty is an essential ingredient of most or all game-theoretic problems and hence, at the very least, has a very close conceptual link with the theory of games. Second, certain tools of the two-person theory of games have been found to be extremely useful in attacking even the one-person uncertainty type of problem. A brief discussion concerning the latter point seems in order.

It may be recalled that one class of two-person games has turned out to be of particular interest; viz., the constant-sum games where the (algebraic) sum of the gains of the two players does not depend on the way either of the players has played but always equals a certain fixed number. (This number is often chosen to be zero and the game is then called zero-sum.) For a given player, each strategy is characterized by the different (positive or negative) gains ("pay offs") he would obtain depending on the strategy chosen by the opponent. (To be precise we should substitute expected or long-run average gains for gains, since chance factors may be present.) The solution proposed by von Neumann and Morgenstern makes each player choose that strategy for which the minimal gain is at least as high as, and possibly higher than, the minimal gain guaranteed by any alternative strategy. Thus the player is maximizing the minimum pay off, or "playing the maximin." (Because of a customary formulation in terms of minimizing maximal loss or risk rather than maximizing minimal gains this principle is usually referred to as the "minimax" principle.) An interesting feature of maximizing the minimum expected gains is that it may lead to a "mixed" (i.e., randomized) strategy as superior to any "pure" (non-randomized) strategy.

Now the same principle (in its minimax form) had been suggested and applied to an important class of statistical problems by Abraham Wald (4).<sup>2</sup> Since there might be two or more minimax strategies not identical in their effects (but guaranteeing the same minimal risk), Wald combined the minimax principle with that of admissibility: to be optimal, a strategy (say  $s$ ) must be admissible; i.e., there must not exist another strategy which promises sometimes a better, and never a worse, outcome than  $s$ .

Following the appearance of 1, Wald reformulated (7) the statistician's problem as one of playing a zero-sum game "against nature," the nature representing the unknown properties of the universe from which the statistician draws his samples. Given this formulation, as well as the nature of the von Neumann-Morgenstern solution for two-

<sup>2</sup> The possibility of applying the minimax principle in statistical problems was mentioned previously in a contribution by Neyman and Pearson (5). Von Neumann's initial publication in the field of game theory (6) antedates 4 and 5, but the present writer is not aware of any influence it might have had on 5 or 4, or, for that matter, of any influence that 5 might have had on 4.

person constant-sum games, it was again natural for the statistician to minimax, so that the "game language" was not inconsistent with his earlier concept of optimality. However, the new language made it possible to pool the results obtained in two previously separate fields (game theory and statistics), with considerable gain for both.

The economic models involving decision making under non-probabilistic uncertainty are very closely related to those appearing in the problem of statistical decision making, hence here again the game language has attained considerable vogue.<sup>3</sup>

It should be noted, however, that recent discussions concerning behavior under uncertainty have led to a formulation of "optimal" behavior which is broader than the maximin principle. Among examples of alternatives to the maximin (minimax) principle one may mention the principle (formulated by L. J. Savage) of minimaxing the regret rather than the loss (or the disutility), the maximax principle of maximizing the maximal (rather than the minimal, as in maximin) expected gain (suggested by F. Modigliani), and the principle of maximizing some weighted average of the maximal and minimal expected gains (suggested by the present writer); all of these are to be interpreted as combined with the condition of admissibility defined above. None of these uncertainty behavior principles commands universal acceptance, since they all exhibit certain unsatisfactory properties. Just to what extent that is inevitable is not yet completely known. In the opinion of the present writer, one should not expect unanimous acceptance of some particular one among these principles, since it seems reasonable that some individuals might, say, find the regret principle a natural one, while others would feel inclined to maximax. In any case, however, if an individual is to have any consistent behavior pattern in non-probabilistic uncertainty situations, he must (implicitly or explicitly) follow some uncertainty behavior principle, whether it be minimax or something else.

### *Many-person Situations*

Where two or more persons participate, we find, in general, that the problem of how an individual should act in a situation of uncertainty is still very much present, but that a rather peculiar type of uncertainty arises in an attempt to anticipate the others' behavior. The problem

<sup>3</sup>An example of a problem of this type treated by game-theory methods: the question of an optimal amount of insurance to be carried. (A Ph.D. dissertation by A. Morrison, Iowa State College, 1949.) Among ideas inspired by the game analogy is that of using randomized strategies as policy tools in situations where it is desired to achieve a certain measure of unpredictability without permitting arbitrary action (e.g., in open market operations by stabilization agencies). Cf. §, p. 418. The problem of how best to aggregate economic variables yields another example of the application of game-theoretic (or uncertainty decision-making) methods (9).

of oligopoly is a classical illustration of this type of situation in economics. Von Neumann and Morgenstern further enriched the problem by considering the possibility of coalitions, threats, and compensations (the latter appearing very naturally in modern welfare economics), regarding these phenomena as unknowns rather than data. The concept of a solution (a set of mutually undominated imputations)<sup>4</sup> offered by von Neumann and Morgenstern for the general case involving an arbitrary number of participants and a wealth of possibilities of communication among players has not found universal acceptance.

Under the circumstances it was natural that a simpler class of game situations, viz., that free of intercommunication among players ("non-co-operative"), should be attacked separately; this was done by Nash (11).

#### *Games without Communication*

In order to appreciate the nature of Nash's proposed solution, it is desirable to return for a moment to the two-person constant-sum case. It was mentioned earlier that the von Neumann-Morgenstern solution in this case makes the two players use their respective minimax strategies. Hence the solution has the valuable property of postulating that each of the players is following a (fairly acceptable) criterion of behavior under uncertainty. A fundamental result, however, of the theory of games shows that (under appropriate assumptions) the two minimax strategies "meet" at a "saddle-point," the important implication being that when one of the players uses his minimax strategy, the other player cannot do any better than to use his minimax strategy. Thus if the two players, after having decided on their respective minimax strategies, revealed the choice, neither would have an incentive to change his strategy, provided that the other player was expected to stick to his (minimax) strategy. Consequently, the saddle-point enjoys a certain equilibrium property: there is a tendency to stay at the saddle-point once it has been reached. This combination of the two advantageous properties of the maximin strategies, viz., "rationality" of the players' behavior (in the sense of their following an uncertainty behavior principle) and the resulting equilibrium, is probably a good part of the reason for the favor which the saddle-point (minimax) solution of the constant-sum two-person game has generally enjoyed.

That (minimax) rationality and (saddle-point) equilibrium can be attained simultaneously is a special feature of the constant-sum two-person games. As soon as the game is two-person variable-sum or it involves more than two persons one must, in general, sacrifice at least

<sup>4</sup> Since the exposition of the general concept of solution would exceed the scope of this paper, the reader is referred to Sec. 30.1.1 of 1 for the relevant definition and to 10 for an exposition against the background of a three-person barter problem.

one of these two features. Nash's solution favors the equilibrium as against the rationality feature of the solution. In fact, his solution is defined in terms of the equilibrium property. For the sake of simplifying the exposition, we shall give the Nash definition for the case of a two-person game only. Let A and B be the two players and denote by  $a$  a strategy of the player A while  $b$  represents a strategy of the player B. The pair  $a, b$  of the two players' strategies is a Nash equilibrium point if the following is true: given that A plays  $a$ , B cannot do better than play  $b$ , while at the same time, given that B plays  $b$ , A cannot do better than play  $a$ .

It may be noted that if the game happens to be of the constant-sum type, the Nash definition yields the same saddle-point solution that is implied by the von Neumann-Morgenstern solution concept (i.e., it corresponds to both players maximinizing). A constant-sum game is, of course, "naturally" nonco-operative. It has been pointed out by Arrow and others that the Nash solution, when applied to the classical oligopoly problem (the mineral water example, for instance), essentially corresponds to the so-called "Cournot solution." It should be noted, however, that since the Nash definition avoids the reaction curve approach, it is immune to the Stackelberg objection: when all oligopolists but one follow the Cournot reaction curve behavior pattern, the one who does not can profit thereby; but if each of the oligopolists sticks to his Nash strategy, then (by definition) the remaining one could not possibly profit by abandoning his Nash strategy.

The present writer's inclination is to question the advisability of seeking solutions possessing the required equilibrium properties but sacrificing the rationality of behavior. To see the disadvantage of the equilibrium approach one only has to visualize an individual who is inclined to follow the maximin principle when faced by uncertainty situations. Such an individual (let us call him A) would be disinclined to count on the likelihood of his opponent B adopting (or retaining) his Nash strategy, since he (A) might suffer considerable losses were B (for whatever reasons) to follow some strategy other than that corresponding to the Nash equilibrium point.

One might, therefore, argue that in a two-person (or many-person) game without communication (Nash's nonco-operative game) each player should simply follow his usual uncertainty behavior principle (whether it be maximin, maximax, or anything else), subject to taking into account such information as he believes to have about his opponent's probable behavior. Thus it would seem safe to assume that the other player will not use a strategy which is inadmissible. This need not be true in a game with communication! The simplest solution then would be obtained by assuming that (after the elimination of all

inadmissible strategies) each player selects his maximin strategy. The simplicity of the maximin (minimax) principle is mainly due to the fact that its nature has been explored much more thoroughly than that of most alternatives. Of course, this would not, in general, result in a Nash equilibrium point. However, the situation obtained would be one of equilibrium nature if the players are genuinely attached to the uncertainty behavior principle being followed. (One might note that on the latter assumption a Nash equilibrium point would lack the equilibrium property!)

It should be stressed that even if the Nash model is inadequate as a basis for a realistic description of what people actually do, and even if one would regard it unwise to advise an individual player to follow his Nash strategy, there is an important area in which the Nash model and solution concepts appear to be tools of great usefulness, both for descriptive and expository purposes. The area meant here is that of the allocative properties of the market mechanism. Thus a position of the market variables (outputs, inputs, consumption levels, prices) attained when every agent in the market finds his utility (profits) maximized, provided he assumes the variables (or reaction patterns) controlled by other agents to be fixed, is clearly a Nash equilibrium point. The basic results concerning the optimal properties of the market mechanism can roughly be summarized in the proposition that in a properly defined market economy a point is one of Nash equilibrium whenever it is Pareto-optimal and vice versa. (A situation is defined as Pareto-optimal if there is no way of raising anyone's utility without lowering that of someone else. For a game formulation of the allocative process, see 12.)

It may be remarked that some of the controversies in the game-theory field result from the lack of distinction between the descriptive as against normative character of a theoretical model; we note that there is a third category of usefulness, viz., as a tool, which includes the utilization of a model for the purpose of setting up an organizational structure. Another source of difficulties, of relevance with regard to models claimed to be realistic, is vagueness as to observational implications of a given solution concept.

### *Games with Communication*

In this field there is perhaps most still to be accomplished; in view of its complexity, this is hardly surprising. While there are some attempts at the application of the proposed solution concepts to economic and other situations, the lack of confidence in the solution concept itself has a tendency to undermine the interest in the applications. (Some contributions in this area are to appear shortly in the *Econo-*



*metrica* and in Vol. 2 of 3, but are not available to the present writer at this time. Among papers of interest in this context one may mention 13 and 14.)

Among attempts known to the present writer to seek an approach different from the solution of 1, two deserve mention. One (Vickrey, 15) appears to be relatively close to the formulation of 1, differing from the latter in that it imposes an additional requirement that the solution be, in a certain sense, self-policing. Another, due to Nash (11*b*, page 295), is based on the idea of fitting the co-operative game into the general scheme of a nonco-operative game; this is to be achieved by introducing such elements as the bargaining process, as well as compensations, etc., explicitly into the game, instead of leaving them on the outside as appears to be the case in 1. (Once it is known how to reduce co-operative to nonco-operative games, there is still freedom with regard to which theory of nonco-operative games is to be applied to the reduced games.) With only very sketchy information available at this time, one must refrain from passing judgment on the chances of success of these proposals in terms of providing a workable and reasonably realistic tool for treating the multiperson games with communication.

Even if the case involving communication cannot yet be handled in a satisfactory manner, game theory (together with recent developments in the science of information and communication, including cybernetics) is to be credited for the increased attention being paid to information and communication aspects of social situations. (See 16 for an example related to certain problems of economic theory.) In the field of economics there is a class of problems very likely to profit greatly from increased emphasis on the information-processing aspects of the economy. Among problems of this class is that of the optimal size of the firm, as well as the more general one of optimal (internal) economic structure of an economic unit, especially with regard to the location of the limiting line between market structure (characteristic of interfirm relationships) and the administrative structure (characterizing—typically, but not without exceptions—the intrafirm relationships). An interesting special case is that of conditions under which a firm is likely to wish to introduce the pricing mechanism as a method of internal allocation of resources.

In a broader perspective, there is reason to hope that the development of an analytic approach to problems of economic structure (whether along the lines just indicated or in some other fashion) will tend to wipe out the traditional division between the theorists and the institutionalists. Recent developments in fields such as the theory of organization seem to add further justification to this hope.

While the present paper is in no way a systematic appraisal of the

impact of game theory and related developments on economics, the writer does wish to express his opinion on one aspect of the manner in which economics has profited from the developments in the field of game theory. Even where the theory of games does not provide satisfactory answers, it has contributed to a more lucid, rigorous, and natural formulation of many problems. In many cases, it has led to the use of mathematical tools not involving calculus and often very close to intuitive thinking, thus creating the possibility of exploiting both the mathematical and common-sense (literary) type of talent available. A further development, which would seem at least partly due to the influence of game theory (as well as to that of statistical decision theory) is a trend toward axiomatic formulation of economic theory, with the consequent increase in rigor and greater transparency in the relationships between assumptions made and conclusions reached.

In the present writer's mind there is little doubt with regard to both the value of what the game theory (with its "relatives") has accomplished, and the length of the road that still remains to be traversed.

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## ACTIVITY ANALYSIS AND ITS APPLICATIONS

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At two earlier occasions I have had an opportunity to make comments of a general character about activity analysis. One of those was in writing the introduction to a volume called *Activity Analysis of Production and Allocation (Proceedings of a Conference)*.<sup>2</sup> There I have discussed how various currents of research in mathematical economics and econometrics have converged in the models of production and programming with which activity analysis is concerned. The other occasion was a paper entitled, "Efficient Allocation of Resources," presented before the Econometric Society meeting in New York, December, 1949, and later published in *Econometrica*.<sup>3</sup> In that paper I have summarized my own investigations into the price implications of efficient allocation in a linear model of production.

If now, at the risk of repetitiveness, I come back to the same general subject again, it is mainly for the purpose of taking stock and looking forward, of exploring both the possibilities and the difficulties of application of activity analysis in various areas. I shall therefore be rather brief in restating the main contents and purposes of activity analysis as developed so far.

Activity analysis is concerned with the construction of conceptual models to study and appraise criteria, rules, and practices for the allocation of resources. In the following respects, it differs from the classical theory of production and prices. In the first place, rather than starting from a production function which is already the result of optimization by the production engineer or manager, it treats the various methods of production that can be used, and the extent to which they are used, themselves as decision variables; in short, it starts from a model of technological possibilities. Secondly, in this way activity analysis either abstracts from institutional arrangements such as the organization of production in firms, or it permits considerable flexibility in specifying alternative forms of organization and in evaluating their effectiveness. In the third place, it provides us with methods of computation indicating what program will best serve a given objective and how to translate

<sup>1</sup> Research under contract between the Cowles Commission for Research in Economics and the RAND Corporation. I am indebted to M. Beckmann and C. B. McGuire for valuable comments to earlier drafts of this paper, which will be reprinted in *Cowles Commission Paper*, "New Series," No. 75.

<sup>2</sup> *Cowles Commission Monograph 13* (John Wiley & Sons, 1951).

<sup>3</sup> October, 1951, pp. 455-465. Reprinted as *Cowles Commission Paper*, "New Series," No. 52.

given valuations of final commodities into valuations of intermediate and primary commodities.

So far, activity analysis has developed linear models of production most fully. These models assume constant ratios between the inputs and outputs of each method of production. They further assume that different production processes do not interfere with each other; that is, that one obtains the net inputs and outputs resulting from simultaneous application of several methods at various given levels by simple addition of the inputs or outputs associated with each method separately at the given level. Finally, these models can be made to recognize and trace the implications of basic limitations on the availability of certain primary factors of production (such as land, labor, equipment, and materials). They then proceed in two directions or stages. While the second stage is logically a specialization of the first, it can be applied directly if the necessary information is at hand.

The first stage is a study of the price implications of efficiency. A combination of activities is called efficient if it does not permit increasing any net output without decreasing another, within the given limitations on primary factors. There are in general many such combinations which together define the efficient point set in a space of which the co-ordinates are commodity flows. (This point set represents what is more commonly known as the transformation function.) However, every efficient point has associated with it a set of efficiency prices. These indicate rates of substitution between different inputs or outputs whenever substitution is possible. While, as said already, they are independent of the existence of a market, they are related to the technological data in the same way as are prices formed in competitive markets. Thus the classical belief of economists in competitive markets as an allocative device to attain or at least maintain efficiency is confirmed by rigorous mathematical analysis, although for a rather narrow model of production. We shall examine its limitations further on.

The second stage is reached when a particular objective function is given. This function acts as an indicator of equally desirable bundles of final commodity net outputs. If this function is linear, we enter the field of linear programming proper. Computation techniques have been most fully developed for this second stage of linear activity analysis. An important example of a linear objective function is the profit attained by a firm operating in competitive markets for inputs and outputs. This application is discussed in detail in a recent book by Robert Dorfman.<sup>4</sup> In other applications, where one is programming for use

<sup>4</sup>Robert Dorfman, *Application of Linear Programming to the Theory of the Firm* (University of California Press, 1951). He also considers the case of a monopolist with a nonlinear objective function.

rather than for sale, one cannot expect constant relative valuations of end products independent of their quantities. In this case a linear objective function may express a tentative anticipation of the "rates of substitution in use" of the various commodities involved. The weights tentatively assigned to the various end products can be revised in the light of the program obtained from these tentative weights.

Let us now consider a few applications where one may feel that this simple linear model represents a set of technological circumstances rather well.

My first example is a model of ocean transportation which has been discussed in two previous publications.<sup>5</sup> In this model the one and only primary resource is use of shipping, the final products are transportation services between pairs of ports, and the intermediate commodities are availabilities of ships at various ports. The activities consist in moving cargoes by ship or in moving empty ships between each pair of ports. If there is no congestion in ports or canals, it would seem that the model described gives a good basis for discussing alternative efficient uses of a given fleet of interchangeable ships. The model can be used to guide centralized allocation of ships to loading ports and routes and to work out "rates of substitution in supply" between transportation requirements competing for the same fleet of ships. It can also be used to explain freight rates formed in a competitive tramp shipping market. The model fails, however, if port congestion becomes important. It is also not applicable to highway or railroad transportation whenever congestion in terminals or on arteries of traffic becomes an important phenomenon. The model can be and has been applied<sup>6</sup> to discuss the problem of how to apportion railroad shipments of a homogeneous product from several sources of supply to several points of use in such a way as to minimize the total freight bill. This solves an important practical problem for the firm or firms producing and marketing such a product. It cannot be regarded as a problem in efficient allocation of resources unless the freight rates used were to reflect the marginal costs of the transportation services in question. This is not true for our present rate structure. Particularly in the presence of congestion, but also without congestion if sizable changes in the composition of traffic were contemplated, freight rates that reflect marginal cost depend on the distribution of shipments by routes.

<sup>5</sup> T. C. Koopmans, "Optimum Utilization of Transportation," *Proceedings of the International Statistical Conference*, 1949 (reprinted as *Cowles Commission Paper*, "New Series," No. 34); T. C. Koopmans and S. Reiter, "A Model of Transportation," in *Activity Analysis of Production and Allocation* (John Wiley & Sons, 1951).

<sup>6</sup> George B. Dantzig, "The Application of Linear Programming Methods and the Simplex Technique to the Hitchcock-Koopmans Transportation Problem," abstract in *Econometrica*, 1950.



The reason why the linear model seems to give a good first approximation in the case of ocean transportation (at least when the indivisibility of the individual ship is unimportant) lies in the fact that the ocean has plenty of room for many and large flows of traffic, and in the fact that twice the number of trips can be made with twice the inputs of shipping, labor, etc. The motivation for the use of the linear activity analysis model in a study of gasoline blending by Charnes, Cooper, and Mellon<sup>7</sup> is less obvious. This problem is one of blending given ingredients into products that meet given specifications and for which given market prices can be obtained. The objective considered is to maximize profit. The specifications for each product place upper or lower bounds on certain physical constants characteristic of the performance of that product. Vapor pressure should not exceed a given number to avoid vapor lock. The performance number should not fall below a given number in order to avoid knocking. Finally the lead content, helpful with regard to mechanical performance, must not exceed a given number to avoid poisoning of personnel. The assumption that makes the linear programming model applicable is that these physical characteristics of any mixture are linear functions of the ratios in which ingredients are blended. This is, as the authors frankly state, an approximation, and its applicability has been questioned by Alan S. Manne.<sup>8</sup> While I am not competent to form a judgment in this matter, it is worth noting that the linear model is here used as an approximation to a set of phenomena agreed to be essentially nonlinear. Other aspects of the model fit very naturally into this application. There is first the discrete decision which ingredients to blend, comparable to the discrete decision which methods of production to combine. There is also the linear profit function. One might ask oneself whether the use of a small number of alternative specifications with respect to the three variables mentioned is the most efficient way for the air transportation industry to utilize the productive possibilities provided by the oil refinery industry. This problem is not the one to which the authors address themselves, and it requires a good deal more data to be discussed fruitfully.

Having looked at these two examples, let us now ask ourselves in which other fields activity analysis may be applied and in which directions it needs to be extended in order to become useful in a greater variety of applications. There are no serious difficulties in the transition from static to dynamic models as long as one maintains the

<sup>7</sup> A. Charnes, W. W. Cooper, and B. Mellon, "Blending Aviation Gasolines—A Study in Programming Interdependent Activities in an Integrated Oil Company," *Econometrica*, April, 1952, pp. 135-159.

<sup>8</sup> Alan S. Manne, "The Strong Independence Assumption—Gasoline Blends and Probability Mixtures," *Econometrica*, October, 1952, pp. 665-668.

assumption of certainty regarding the outcome of technological processes and regarding the objectives to be served by the allocation of resources. A dynamic extension of the linear model along these lines has been provided by Edmond Malinvaud in a forthcoming paper.<sup>9</sup> One new difficulty here is that of how to value, at the end of the last period considered, the capital goods which are not in themselves ends of productive activity. With the thoroughness of a mathematician, Malinvaud resolves this by considering an infinite number of periods of production.

Perhaps the most interesting part of his investigation is that where he examines stationary states characterized by capital scarcity. New insights into the theory of capital and interest are gained in this study.

It does seem that the theory of international trade also offers opportunities for fruitful application of linear activity analysis as it stands. Frank D. Graham's book on *The Theory of International Values* (1948) can be regarded as an opening move in this direction. Papers by Thomson M. Whitin and by Lionel W. McKenzie, presented in another session during these meetings (and which are to appear in abstract form in a forthcoming issue of *Econometrica*), go further along these lines.

New problems have to be faced if one attempts to extend activity analysis to cover aspects of technological reality that cannot be represented in a linear model. Perhaps the two most pressing groups of problems are those connected with indivisibilities, and those arising from random elements in the outcome of productive processes.

Indivisibilities pervade our entire technology. Indivisibilities in plant and machinery are responsible for the greater productivity of large-scale methods of production. The indivisibility of the human agent is to a large extent responsible, through specialization of function, for the so-called "external economies" found in highly industrialized areas.

A simple example of an allocation problem involving indivisible resources is the assignment problem, proposed by R. L. Thorndike and analyzed mathematically by J. von Neumann and others.<sup>10</sup> Consider  $n$  persons and  $n$  pieces of equipment each requiring one operator. Let the value produced per day by a given person if assigned to operate a given piece of equipment be known for each of the  $n^2$  conceivable per-

<sup>9</sup> Edmond Malinvaud, "Capital Accumulation and Efficient Allocation of Resources," *Econometrica*, April, 1953.

<sup>10</sup> R. L. Thorndike, "The Problem of Classification of Personnel," *Psychometrika*, 1950, pp. 215-230; J. von Neumann, "The Problem of Optimal Assignment and a Certain Two-Person Game," to appear in *Contributions to the Theory of Games*, Vol. II (Princeton University Press); D. F. Votaw and A. Orden, "Personnel Assignment Problem," in *Symposium on Linear Inequalities and Programming* (U. S. Department of the Air Force and the National Bureau of Standards, 1952).

son-and-equipment combinations. The problem is to find that one of the  $n$  conceivable assignments of all persons to pieces of equipment which maximizes total value produced.

Von Neumann constructed a two-person zero-sum game which is equivalent to this assignment problem in the sense that a solution to the game implies a solution to the assignment problem. To be precise, the best strategy of the first player is equivalent to the choice of an optimal assignment. This result, interesting in itself, is also of practical value because it leads to an important reduction in the computational work needed to obtain a solution of the assignment problem.

Further analysis by Beckmann and Koopmans has shown that the best strategy of the second player defines efficiency rents and wage rates for pieces of equipment and persons, respectively. These efficiency prices satisfy the following two conditions:

1. No equipment-person combination produces a value in excess of the sum of daily rent and wage rate for that combination.
2. The value produced by any equipment-person combination that occurs in the optimum assignment just pays for the sum of rent and wage rate for the combination.

It follows that if such prices were to prevail in markets for equipment and labor, they would maintain the optimum assignment under profit maximization.

It will be noted that these conditions are very similar to the price conditions for efficiency found in linear activity analysis. The reason is that von Neumann's solution rests on introducing probabilities by which a given person is assigned to a given piece of equipment. This converts the assignment problem into a linear activity analysis problem. However, the indivisibilities present in the original assignment problem still have interesting consequences: the efficiency prices are not unique. The division of the product within each equipment-person combination is determined only within a certain range, which is limited by the requirement that non-optimal combinations shall not become profitable. In addition, simultaneous changes in all prices that transfer an equal amount from each equipment owner to each operator also leave intact the optimum-preserving property of this price system.

The situation is different in a locational assignment problem proposed by Beckmann. In this problem, plants (embodying specific methods of production) are assigned to locations instead of persons to equipment. This would not modify the problem so long as we neglect the cost of transporting intermediate goods from one plant to another. When that cost is taken into account, the problem becomes quadratic rather than linear. Preliminary exploration suggests that in this case no set of prices with the properties listed above exists. Economists have

often suspected that the price system cannot bring about or maintain an efficient locational distribution of activities. As causes of failure they have pointed to various interactions like noise, smoke, vibration, or spoiling the scenery. We now suspect that the mere fact that goods and persons rendering services need to be moved between establishments is sufficient to defeat the price system as a means of attaining or maintaining an optimum locational pattern. If this were to be substantiated by further analysis, we would be led on to the surprising conclusion that only the high transition cost of a change in location introduces some degree of stability in the actual locational pattern. Without that, one can easily conceive of cases where a change in location by one plant would always tilt the scale toward a move for at least one other plant, under competitive pricing.

I shall be briefer about a few other problems in which indivisibilities enter into the scheduling of successive events. An important class of these problems arises in production scheduling, as discussed by Melvin E. Salveson in "On a Quantitative Method in Production Planning and Scheduling" (*Econometrica*, October, 1952, pages 554-590) and by William W. Cooper, Abraham Charnes, and Donald Farr and by James R. Jackson at another session during these meetings (whose papers are to be printed in abstract form in a forthcoming issue of *Econometrica*). In this problem each of a number of pieces of material have to be taken through a sequence of operations, each operation requiring one out of a given set of machines. Often the order of these operations on a given material is prescribed or, in any case, subject to some restriction. The problem is how to schedule the sequences of operations on each machine and for each material so as to have best utilization of the set of machines, in some well-defined sense. The indivisibility aspect is that normally each machine can be applied to only one material at a time. The possibilities of using a price system, actually or conceptually, in dealing with this problem are largely unexplored. In any case, problems that have this structure are of wide occurrence. The problem of making appointments of given durations between a number of people, with given restrictions on the order in which each person sees others, is in the same class. So is the problem of making up a railroad time table.

Indivisibilities enter in a somewhat more complicated manner in the problems of river valley development. There is first the discrete choice of sites of dams. Once this choice has been made, the height of each dam is still subject to continuous variation, but the range of variation that is worth considering does not extend down to zero. Too low a dam is of no value! The policy governing the water level above each dam in response to experienced or expected rainfall is again capable

of continuous variation. Thus we have a few discrete choices followed by further choices of continuous parameters.

Random elements in the outcome of production processes are an important aspect of agricultural production. The attempt to develop a theory of prices as guides to allocation in such circumstances is likely to involve the study of crop insurance schemes as a means of reducing the risk upon the individual decision maker.

Both indivisibilities and random elements enter into the study of congestion phenomena. For instance, the average delay occurring to a vehicle in traveling on a highway depends on the density of traffic, but in particular instances this delay is subject to random fluctuations due to coincidences in arrivals at the same intersection or in intended use of the same piece of highway by individual vehicles. Even though it is hard to think of actually using "efficiency tolls" to obtain best utilization of the highway system, it would be of interest to have a measure of the social cost, in terms of delay to other traffic, involved in a given vehicle's choice of a given route. Indivisibilities enter into this problem in the case, studied by McGuire and Winsten, in which individual vehicles pursue different speeds, thus giving rise to different social costs.

In conclusion, I wish to indicate the two purposes that have guided the studies in activity analysis I have described. One of these is to have another look at the price system as a means of allocating resources. On the one hand, the price system could be used more fully than it is at present. For instance, there are at present no market prices to guide the routing of empty railroad cars in the same way in which the routing of empty tramp ships is guided by the pattern of freight rates. Without actually establishing competitive arbitrage operations in railroad cars at different locations, the notion of efficiency prices could be used in procedures for efficient routing of empty railroad cars. On the other hand, we may be taking the presumable efficiency of allocation through competitive markets too much for granted. The remarks I have made about locational choices give one reason for doubt here. Economists are sometimes insufficiently aware of the narrow basis of technological assumptions on which their traditional belief in the allocative efficiency of competitive markets has so far been substantiated by analysis. Much further research, in large part of a mathematical kind, is needed to assess the possibilities and limitations of the price system as a method of allocating resources.

The second purpose is to develop computational methods and equipment that can be used to deal with complicated allocation problems even in those circumstances where pricing systems do not help us in finding a solution. This may come about because the mathematical structure of the problem does not permit the definition and evaluation



of efficiency prices. Or it may come about because centralized control is already established and no advantage is expected through decentralization by a price system.

Let me end by expressing the belief that formal and abstract mathematical analysis such as I have discussed is actually bringing economic theory closer to application. Whenever a new aspect of technology has been formalized and introduced into these models, additional possibilities for application are opened up. Thus, increasing mathematical formalization actually leads to greater usefulness of theory.

## DISCUSSION

WILLIAM J. BAUMOL: The three very fine papers presented by the speakers, since they are essentially expository in nature, call for little discussion. I shall therefore use Professor Strotz's words as an excuse and an occasion for a confession.

In shouting "bravo" to his admirable statement on the measurability of utility I have, to a considerable extent, retreated (and, I might add, retreated in very good company) from a position which I held earlier. (See my "The Neumann-Morgenstern Utility Index—an Ordinalist View," *Journal of Political Economy*, February, 1951.) Under the patient tutorship of Professors Friedman, Marschak, and Savage, as well as others, I have seen the light. I see now that there exist most persuasive definitions of rationality which lead us to the conclusion that the consistent calculating man will choose and prefer in a way which can be described by a Neumann-Morgenstern index of utility. In other words, such an index will permit us to make valid predictions about the behavior of this rational "calculating boy." For the N-M index straitjackets preferences—given his ranking of all riskless possibilities and only one of those sets of lottery tickets which all have the same given winning prize (say \$100) and the same given booby prize (say zero), it permits the individual no choice on any other risky proposition—all such propositions are preranked for him! But it turns out that this is not really as presumptuous as at first appears. A man who is rational in the sense defined by Marschak in "Rational Behavior, Uncertain Prospects, and Measurable Utility" (*Econometrica*, April, 1950) (or by I. N. Herstein and J. W. Milnor in "An Axiomatic Approach to Measurable Utility," *RAND Paper*, P-139, ditto) will have no quarrel with this choice. The choices made for him by the index are exactly the choices he would have wanted to make himself if he had been clever enough to go through the difficult computations correctly. That is essentially what I had not seen when I wrote my paper on this subject.

However, this is not the end of the matter. Really it is only the start. In this connection there are four points I should like to make, most of which would, I think, be accepted by all participants in the argument.

1. Just because a superclever rational man will behave in the way required by the index, it does not follow that real men do so. We are left with the infinitely more important problem of empirical testing on which only beginnings have been made. True, we are frequently willing to accept a rationality hypothesis as a basis for economic theorizing. But because of the complexity of the required computations and the apparent importance of whim, hunch, and passion, there may be distinctly less a priori plausibility to an assumption of rationality in the analysis of gambling behavior, say, than in the theory of the firm. Here especially, then, empirical testing would seem to be required before we can be convinced of the usefulness of the construction.

2. The utility measured by the index is, as Strotz indicates, not the utility the neoclassicist spoke of and whose second partial derivatives he introspected to be negative (diminishing marginal utility). It is therefore perhaps un-

fortunate that the term has been and continues to be applied to the index. Much of the confusion in the discussion might have been avoided had other nomenclature been used.

3. Old-fashioned cardinal utility is neither meaningless nor pointless if not taken too literally. It may be indispensable for some problems of group decision making and welfare economics. Moreover, we are willing to accept rough calculations of the sort required, in our everyday living. The mother who decides which crying child to take care of first may have made a crude interpersonal comparison of (cardinal) utility. Similarly, we may be prepared to agree that a holdup murder which nets its perpetrator twenty cents has gained him less than it cost the victim. Judgments of this sort are relevant for every political decision which benefits some and is deleterious to others. Incidentally, as Clifford Hildreth has indicated in "Alternative Conditions for Social Orderings" (*Econometrica*, January, 1953), unwillingness to make this sort of interpersonal comparison, which is manifested in taking into account no more than the rankings (ordinal preferences) of the members of the community, is a source of the difficulties which Kenneth J. Arrow has brought to our attention in *Social Choice and Individual Values* (Wiley, 1951).

4. It is possible (this is no more than a hypothesis) that the psychology of gambling is such that rationality as defined straitjackets preferences less effectively than might at first appear. (This was first suggested by Samuelson in an unpublished paper.)

As I have said, the N-M index automatically ranks all gambles for an individual given little more than his ranking of the prizes (winning and booby) and the relevant probabilities. Thus, if we have a lottery ticket which offers a fifty-fifty chance at winning \$10.00 or losing \$2.00, and have a figure giving the N-M utility of the \$10.00 gain and of the \$2.00 loss, we can compute the utility of the gamble. Knowing these utility numbers for any two gambles, they are automatically ranked for us. It would thus appear that, knowing only about the attitude of the rational man toward all possible riskless gains like the certain gain of \$10.00, all gambles are ranked for him. However, a gain of \$10.00 may mean different things in different circumstances. For example, the gambler may get much more joy as he walks away from the betting window out of the \$10.00 he won on a long shot than from \$10.00 earned by working, or even from \$10.00 won on a pretty sure thing. If this is so, for him the utility of the prizes from gambles will vary with the terms of the gamble. To rank his preferences on all gambles with the aid of the N-M index it is not enough to ask him questions about his attitude toward different sums of money. We must ask him many other questions, for each gain specifying the various ways in which it may accrue to him. In particular, for every gamble we must ask him questions about his attitude toward its peculiar possible outcomes. We cannot as it were rank it behind his back. That is to say, we cannot deduce his ranking of the gamble from his ranking of things which can be obtained by him without his having undertaken that gamble. If this empirical hypothesis is true, then the straitjacketing of preferences (i.e., the possibility of predicting) which the N-M hypothesis results in for the rational man (in the sense defined) remains formally valid but much of its force is lost.

# RESEARCH

## SOME CONTEMPORARY TENDENCIES IN ECONOMIC RESEARCH

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If the title of this paper were to be more completely stated, it would read: "Some Contemporary Tendencies in Economic Research as Revealed in the Second Volume of *A Survey of Contemporary Economics*." The present paper, therefore, is complementary to one based upon the first *Survey* volume and read by Howard S. Ellis at a round table on economic research at the 1948 annual meeting of the Association. Together, the two papers constitute a report of the views of twenty-three authors with regard to research tendencies and needs in the various fields of economics which they respectively reviewed in the two volumes.

The ten authors of the essays in the second volume were requested to include suggestions as to directions which, in their opinion, future research might profitably take. Most of them did so. In addition, several of the twenty "critics" who prepared short comments upon the essays made some mention of research needs in their respective fields. Furthermore, throughout the volume research tendencies and requirements are revealed, not only by the explicit suggestions offered, but also by the many references made to the inadequacies of our present knowledge.

My task of reviewing this very considerable body of material in the second *Survey* volume is substantially facilitated by the fact that one of the ten authors, Richard Ruggles, in his essay on "Methodological Developments" was himself concerned with the review of recent and contemporary tendencies in the use of different research techniques in economics as a whole. It will be convenient, therefore, to begin my report with a statement of some of his findings.

Ruggles considers five different methodological approaches to research in economics: the mathematical, the statistical, the econometric, and the institutional approaches and what he calls speculative analysis. With regard to these various approaches, the following tendencies in the past twenty years warrant, he believes, particular notice:

1. There has been a significant increase in the application of mathe-

matics to economic theory. Particularly important has been the development of mathematical and econometric models—in some cases coupled with the endeavor to apply to them empirical testing techniques. These models were at first rather simple affairs designed to illustrate theoretical interrelationships, but they have become much more complicated as the attempt has more recently been made to explore the dynamic economic world and reduce it to order by means of this technique. The way this has come about has been pointed out by Evsey D. Domar in his comment on Ruggles' essay (page 454):<sup>1</sup>

With the increasing emphasis on the control of our economic environment and the consequent expansion of governmental activities, problems which could be dealt with by common sense or with simple two-dimensional diagrams have tended to recede in importance and to be replaced by larger questions regarding the working of the whole economy which involve complex chains of causation, frequently of a reciprocal nature and operating over different intervals of time. To handle them by intuitive common sense requires a most unusual ability, while even a modest mind can get some results by means of an explicit mathematical model.

As examples of the kind of mathematical models that have been developed, aggregative dynamic stochastic models designed to allow for random disturbances and linear programming models might be mentioned.

2. During the period under review there have developed important techniques for classifying and organizing statistical data with regard to the working of the economy as a whole. The most important examples are national income accounting, input-output tables, money-flows accounts, and wealth accounts. In important respects, Ruggles believes that the development of these techniques has tended to bring theorists and statisticians closer together.

3. Institutionalism has "permeated the whole of economic analysis and has become more or less integrated with the other approaches" (page 427). But in the last twenty years those concerned with institutional analysis have not felt obliged to reject theoretical analysis.

4. In addition to basic research, there has developed an important and useful body of policy-oriented research by such groups as the Brookings Institution, the Twentieth Century Fund, and the Committee for Economic Development. A large part of research done by government agencies is of this kind and has become increasingly important in the past twenty years.

These are the four major tendencies in economic research that seem to have most impressed Ruggles in his review of the past twenty years. I turn now to consider the suggestions of the other authors as to the directions which, in their opinion, future research might profitably take in their respective fields. The nine fields with which they are

<sup>1</sup>The page references throughout the present paper are to *A Survey of Contemporary Economics*, Vol. II, B. F. Haley, ed. (Richard D. Irwin, Inc., 1952).



concerned are: welfare economics, economics of consumption, population theory, economics of growth, theory of the firm, economics of agriculture, public finance, international finance, and national economic planning. It will be convenient to group these research suggestions, not by fields, but by techniques of research involved. As will appear evident, this is not always satisfactory, as sometimes a proposed line of research clearly involves more than a single research technique; and in fact, the research techniques to which reference is here made are far from being distinctly separable from one another. However, by this method of classification, the essential similarity of research problems in the different fields will become evident; and the close parallel between Ruggles' four tendencies in recent economic research and the directions in which the other nine authors believe future research should move will also become apparent.

1. *The Need for New Hypotheses.* Milton Friedman, in his comment on Ruggles' essay, points out that the attempt in recent times to achieve descriptive realism in economic theory has resulted in "something of a vacuum in the equally vital intermediate area of theories or hypotheses that have implications about important phenomena susceptible of contradiction through observation" (page 457). This view is perhaps supported by the fact that the authors whose essays I am reviewing do offer an extensive list of suggestions as to needed developments in theoretical analysis.

By far the greater part of these suggestions are concerned with the need for a more dynamic type of analysis. Thus Kenneth Boulding points out that present-day welfare economics has been derived essentially by the method of comparative statics and that it therefore is not adequate for dealing with the larger dynamic questions of economic development, with situations involving a "money illusion," or uncertainty. The implication is that welfare economics needs to be further developed to reflect the conditions of a dynamic economy. Similarly, A. G. Papandreou urges that, in the theory of the firm, we should experiment with a variety of different models based upon various assumptions as to the preference function maximized by the entrepreneur, as to the nature of expectations held, and as to the "structure of control" over the firm. And Gale Johnson points to the need for research as to the effects of risk and uncertainty upon the structure of the farm firm.

The need for more in the way of dynamic analysis is particularly brought out in the essay on the economics of growth by Moses Abramovitz. We need to know more about the interrelation between business cycles and economic growth; the relation of the violence of business fluctuations to the proportion that savings and investment bear on the

average to total income; and other aspects of the question of the long-term significance of thrift in an environment of business fluctuation. With respect to the determinants of potential productivity in a developing country, we need to study the factors usually held constant by traditional theory, such as the composition of demand and the state of the arts. We must learn about the processes by which capital formation gathers strength, obstacles are overcome, adjustments are made in the allocation of resources and composition of output in a developing country—with due regard for the differences that will prevail in these respects in different countries. And J. J. Spengler points to the need for further knowledge about the interrelations between population growth and economic development.

Spengler also believes that population theory in general, like much of economic theory, has suffered from an excessive reliance upon essentially static models; and he calls for the development of a more dynamic theory—particularly by means of the historical method. R. B. Vance adds the comment that such a theory is particularly needed with regard to internal migration; and Johnson suggests that research as to the mobility and migration of labor, between agriculture and the rest of the economy as well as between agricultural areas, would contribute to a much-needed general theory of resource mobility.

In addition to stressing the need for a more dynamic economic theory, several of the authors point to other specific gaps in our theoretical structure. J. S. Davis urges that the hypothesis of Keynes and Hansen, that there is a narrow limit to the rate at which the consumption level of an advanced people can rise, should be re-examined. Abramovitz stresses the need for further knowledge of the trends of the savings-income ratios and their relation to economic growth. He likewise suggests that further theoretical work, together with historical studies, is desirable with regard to the long-run effects of an increasing money supply on investment in a cyclically disturbed environment. Spengler says that the theory of the optimum population should be re-examined and restated in terms of the findings of the newer welfare economics. Lowell Harriss, while reporting that the inappropriateness of partial equilibrium analysis for the study of the effects of major taxes is now recognized, also says that little has yet been done by way of developing a broader theoretical analysis based on a general equilibrium approach that would include consideration of the economic effects of the expenditure of tax funds.

2. *The Need for Empirical and Statistical Studies.* Particularly in the field of consumption economics, there is stress upon the need for empirical and statistical studies. It is not surprising that the wealth of materials that has comparatively recently become available through

area surveys and new time series, together with the progress already achieved in the empirical studies of the past fifteen years in particular, would whet the appetite of workers in this field for still more such studies. Ruth Mack, with regard to the various circumstances that influence the disbursements of individuals, would like to have more exact information as to the way in which family disbursements of various sorts vary with family income; as to the length of the time period during which a recent change in income will affect current spending; as to the effect of the "competitive illusion" upon spending, particularly with regard to different classes of commodities; as to the effect of the rate of change in prices upon consumer buying; and as to the differences in spending-saving patterns for different socioeconomic groups.

She also hopes that further studies will give us more confidence in our tentative answers to questions regarding changing disbursements of groups through time. What is the long-run trend of the average propensity to consume? As a basis for predicting the short-run change in the marginal propensity to save, how are short-run changes in income likely to be distributed, and what is the shape of the propensity for the top quintile of the income range? What can be learned about the consumption functions for different sorts of commodities? Finally, she points out the need for extensive research on the impact of consumer buying upon the economy at large:

We simply do not know and are only beginning to inquire how producers sense and react to a change in sales or orders or, perhaps, in expectations based on other things. (Page 78.)

The necessary empirical studies will probably have to be made industry by industry.

Davis, commenting on Ruth Mack's essay, sees the need for still other empirical studies: as to the way in which levels of consumption and living change through the life cycle of individuals, in the course of economic fluctuations, and in war and peace. He believes that the whole subject of income inequalities needs to be re-examined in terms of inequalities in levels of consumption and living. Consumption needs also to be analyzed by age groups. The attempt should be made to develop usable indexes of levels of consumption and living for individual nations and intranational groups over time.

The essay on population theory by Spengler also yields numerous suggestions as to desirable empirical studies. In order to improve the basis upon which population forecasts are made, it is desirable that research be carried forward on the responsiveness of natality, mortality, migration, and population growth to cyclical and longer-run changes in income. Empirical studies are also suggested with regard to

the socioeconomic determinants of population growth. He suggests, also:

Information is required respecting both the connections obtaining between income-growth rates and living rates and the processes and mechanisms that underlie changes in the aspirations, living standards, or rates of living of various groups and peoples. (Page 105.)

In his essay on the economics of growth, Abramovitz sees the need for empirical studies with regard to the process of factor absorption in an expanding economy as the supplies of the factors increase; and with regard to the effects of increases in the amounts of the factors actually employed upon the size of the product (that is, the laws of returns).

The need for fuller understanding of the functioning of a dynamic economy is also evident in Papandreou's treatment of the theory of the firm. He suggests that empirical research might throw light upon the value of such treatments as Shackle's of the subject of expectations and uncertainty from the point of view of the firm. With the agricultural enterprise particularly in mind, Johnson urges that further research be undertaken with regard to the production function, so that the effects of changing resource use might be indicated. Research should be continued on the interrelations between economic fluctuations in agriculture and in the rest of the economy.

In the case of the personal income tax, Harriss points out that some sort of capitalization process seems to take place with regard to an increase in expected future taxes that fall upon the income attributable to a specific asset; but we still have much to learn about the extent to which such capitalization occurs, the degree of its permanence, and its effect upon yields of other assets.

Finally, Paul A. Baran points to the usefulness of the input-output technique, in contrast to "the main body of our customary economic theorizing" (page 402), as a means by which economic analysis might contribute to national economic planning. And Domar stresses the importance of this same technique as a means for developing a genuinely dynamic economics.

3. *The Need for Institutional Studies.* In five of the nine fields covered, research along institutional lines is indicated. In the case of consumption economics, Ruth Mack points out that the experiments of psychologists, interviews with consumers, and area surveys and statistical studies can be brought to bear upon the analysis of the relation between income-linked standards of living and people's buying and saving. (Both she and Abramovitz would like to have an independent test of the Duesenberry hypothesis with regard to the im-

portance of emulative drives as they affect savings and consumption.) A wide variety of other institutional factors affecting individuals' buying and saving also need to be studied: the effect on consumption and saving of available services provided outside of the money economy proper and of those provided free by the state, and the effect of increased institutional and public provision of insurance against sickness, old age, or unemployment. Davis emphasizes our lack of knowledge of the influences raising and lowering levels of consumption, of ways in which levels interact with standards of consumption and living, and of the interactions of levels of consumption with population growth.

In his discussion of population growth, Spengler describes the various classifications of countries with respect to their potential rates of population growth. He urges that the validity of these classifications should be examined from the point of view of demographic reality, since it is of political, economic, and military importance to be able to make use of such a scheme for forecasting purposes. He also sets as one of the three main tasks of population theory: the analysis of the interrelationships between the circumstances affecting the growth of population in one country and those affecting its growth in other countries. In the more strictly economic sphere, he points to our lack of information with regard to the socioeconomic effects of quantitative and qualitative changes in population upon investment and saving, and how these effects vary with different institutional arrangements.

With regard to the theory of economic growth, both Abramovitz and Johnson see the need for much more research as to the institutional circumstances that condition the progress of technological knowledge and the application and diffusion of new discoveries in production. Johnson is also interested in the ways in which technological advances in agriculture may be expected to affect the relative and absolute employment of resources in agriculture; and T. W. Schultz suggests that it now should be possible to analyze more effectively the circumstances responsible for the substantial shift in the supply schedule for agricultural products that has occurred in the past forty years. Again with regard to economic growth, Abramovitz points out the need for more penetrating empirical studies of the institutional sources of disparities between potential and effective private productivity of capital—such as rates of taxation and subsidy, government regulation of business, the distribution of property and legal provisions with respect to property, the kind and extent of monopoly controls over markets, and many others. In general, Abramovitz reminds us, the economics of growth is a field in which institutional circumstances are particularly relevant (page 176):



We shall be involved not only with numbers of workers, machines, acres, tons, or square yards of commodities, and the like; we shall also need to consider less easily grasped attributes like mobility, industry, enterprise, thriftiness, knowledge, and skill and their diffusion.

Domar believes in fact that "the recent revival of interest in 'institutional economics'" is attributable mainly to the stimulus coming from studies of economic development:

... which reveal the striking absence in many countries of such economic amenities as a disciplined labor force, a tolerably well-trained and reliable industrial and governmental bureaucracy, a banking system, and what not, and thus lead to the construction of institutional models which will, I hope, make this branch of economics less sterile and more purposeful. (Page 455.)

Other institutional studies are suggested by Johnson and by Schultz. In the field of agriculture, there is need for an analysis of the process of farm enlargement and consolidation. And further work, Schultz points out, needs to be done on the problem of the instability of farm prices.

4. *The Need to Extend the Borders of Economics.* Particularly in the field of economic growth, research suggestions call for broadening the scope of economic analysis to include the contributions of the other social sciences. As Abramovitz has put the problem (page 177):

Economics, in fact, if not in intention, has been the science which studied the implications of changes in pecuniary advantage. But population growth, changes in industrial and financial organization, technological progress and its diffusion, the changing vigor of enterprise, differences in industrial and geographical mobility—none of these can be adequately, or probably to any considerable extent, understood in terms of pecuniary advantage. The economics of growth is, therefore, the field of work in which the dependence of economics upon its sister social sciences appears in a supreme degree.

In particular, we need to know more about the institutional causes of the accumulation of wealth: "what sort of cultural and psychological forces create the required social and religious sanctions, provide the security, make wealth the hallmark of distinction, and establish family affection as the most respectable of passions" (pages 152-153). We need to know more about the factors controlling the origins and development of a pecuniary culture.

In the field of population theory, also, as Spengler stresses, a multi-science approach is required. The student of this field must not only call upon all of the social sciences but must occasionally draw upon the natural sciences as well. He states:

The study of population problems probably is more suited than any other to become an area of inquiry within which adepts in social and cognate sciences, together with engineers and practitioners, may freely mingle and merge the relevant findings of their respective sciences. (Page 126.)

Finally, in the field of public finance, Harriss and Roy Blough both urge that the field of public expenditures be subjected to careful and extended study—with the necessary attention to institutions and proc-

esses and with the co-operation of other specialists, such as engineers, educators, medical doctors, social workers, diplomats, and military leaders. And with regard to the problem of progression in taxation, Harriss again reminds us of the need for reliable guides for treating people differently—an area of study involving ethics and psychology as well as the economics of welfare.

5. *The Need for Historical Studies.* The extended use of historical studies to supplement empirical and institutional research is urged in the fields of the economics of growth and of population theory. Simon Kuznets points out the need for combined statistical and historical analysis of the economic growth of different countries, with an intensive study in each case of the interrelations of the various circumstances affecting growth over the long run. And Spengler expresses the hope that long-period historical analyses might fill present gaps in our information about the course of demographic change in time “by envisaging the movement of population as but one aspect of the phenomenon of growth, development, and change” (pages 126-127).

As examples of somewhat narrower historical studies suggested, there is the proposal by Abramovitz that a historical study of the varying size of the financial spread in different countries might give some “measure of the contribution that financial law, institutions, and agencies have made over time and in some places to the accumulation of capital” (page 165). (The financial spread is the difference between the effective marginal productivity of capital and the net yield of loans from the point of view of the lenders.) And in the field of consumption economics, Ruth Mack suggests that historical studies of output and sales for important new consumer goods might help us to explore the problem of market saturation.

6. *The Need to Re-examine Present Policies and to Analyze Proposed Policies.* Several of the essays placed considerable stress upon questions of policy in the fields with which they were concerned; and out of such discussion emerged suggestions for research as to the results of present policies and the possible consequences of proposed policies. Such questions received particular attention in the essays on public finance and international finance, but they also arose, although less frequently, in other essays as well.

Thus Davis raises the question of the effect of postwar foreign-aid programs and of the current rearmament program upon the consumption level of the United States: have these programs been essential to maintain and promote the advance of the consumption level or have they on the contrary tended to impair it? The implicit problem has appeared before in the present review in connection with Ruth Mack's concern with the long-run trend of the average propensity to consume,

Spengler's interest in the effect of quantitative and qualitative changes in population on investment and saving, and Abramovitz' question as to the long-run significance of thrift for economic growth.

Spengler raises two very important questions with regard to policy in the population field: What are the practical implications of a state policy of promoting population growth? And what are the financial, budgetary, and other implications of population aging for public and private industrial policy?

In the field of public finance, Harriss points out, conditions change so rapidly that studies become quickly out of date and policies need frequently to be reappraised. The present very high level of government revenues and expenditures in the important countries make such reappraisal particularly important at the present time. As a basis for public policy formulation in this country, it would be helpful to have more reliable knowledge as to the way in which the present tax burden is in fact distributed. With regard to particular taxes, there are many policy questions involved in the definition of income employed for the personal and corporate income taxes. For example, what is the best method of including capital gains and losses in the tax base? Particularly in an economy in which inflationary pressures are strong, a study should be made of the relative merits of corporation taxes and sales taxes. If the excess profits tax is to be continued, we need to study possible means of offsetting the bad effects the tax tends to have upon the allocation of resources, in promoting wasteful business spending, and in strengthening inflationary tendencies. We also need to make a thorough analysis of the place of death taxes in the tax structure.

Norman Buchanan, in his review of the unresolved problems in international investment, stresses two closely related policy areas with respect to which basic principles should be formulated: First, the political economy of international capital transfers on public account should be carefully re-examined. Intergovernmental loans for combined political and economic ends clearly involve some serious and as yet unsolved problems of major consequence to this country. Second, there is a whole congeries of problems connected with the role of foreign capital in economic development, which can be exemplified by repeating only a few of the questions Buchanan raises: What proportion of the total investment for economic development should be permitted to come from abroad? If foreign capital is to provide some portion of the investment, what are the relative merits of the "project approach" and the general assistance approach? What are the means and devices by which foreign assistance can best be rendered? For example, under what circumstances should grants and under what circumstances should loans be used? How far should the donor or lend-

ing country or institution emphasize the international aspects of the development schemes of the recipient countries?

In his comment on Buchanan's essay, Ragnar Nurkse adds two further questions: What can be done to enlarge the market of industries working for the domestic market in economically backward areas? And what can be done to stimulate the flow of international investment on private account? John Williams, in his comment, states as the most important problem in the field of international investment the very serious lack of balance that has developed between the expansion of primary production and that of industrial production. In order to resolve this imbalance, not only international investment policy is involved, but also domestic policies with regard to production in the economically more advanced countries.

This completes the review of research suggestions offered by nine of the authors and ten of the critics participating in the second *Survey* volume. It is tempting to draw some general conclusions with regard to the present state of economic research upon the basis of this collection of suggestions, but I suspect that any such conclusions—unless based upon other evidence as well—would be of doubtful value. Instead, I shall point out a few of the precautions that should be kept in mind.

First, although it is entirely possible to estimate the relative importance of research needs in the different fields reviewed upon the basis of the number and kind of suggestions offered, any such estimate cannot mean much. As it happens, the research suggestions I have been reviewing are most generously provided by the authors and critics concerned with the economics of growth, consumption economics, population theory, public finance, international finance, and the economics of agriculture in about that order. This difference in emphasis was as likely as not substantially colored by the research interests and predilections of the respective authors, the extent to which they were unhappy about the present state of their subject-matter fields, and even the extent to which the authors felt seriously restricted by editorially imposed space limitations.

Second, for similar reasons, not very much reliance, although perhaps a little more than in the former case, should be placed upon the differences in methodological techniques stressed in the different fields—since here again the personal background of the authors can easily have played a part. However, for what it is worth, it can be pointed out that the need for empirical research is particularly stressed in the essay on consumption economics, the need for theoretical and institutional studies is stressed in the essay on the economics of growth, and the need to broaden the borders of economics and bring to bear con-

siderations pertinent to the other social sciences is stressed in the essays on the economics of growth and on population theory. Naturally enough, policy questions are most important in the fields of public finance, the economics of agriculture, and international finance.

Third, it must be noted that many of these suggestions of needed research very likely have not been tested for practicability. It is all too easy for us to dream of the knowledge we would like to have. Some of these proposed studies are feasible and some of them are obviously not feasible at all—at least for the present. Ruggles in his essay (page 450) has given us a piece of good advice that is worth repeating here:

... there is one fairly common characteristic of academic economics. . . . Problems which might be solved but are relatively unimportant are put aside, while the major efforts of academic economists go into the larger and (at present) insoluble problems. Ultimate aims are thus sought directly. Economics might well progress faster if the dictum of von Neumann and Morgenstern, that "the great progress in every science came when, in the study of problems which were modest as compared with ultimate aims, methods were developed which could be extended further and further," were more widely appreciated.



## ECONOMIC RESEARCH IN RELATION TO PUBLIC POLICY

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Just one hundred years ago, Sir George Cornewall Lewis opened his *Treatise on the Methods of Observation and Reasoning in Politics* (London: Parker, 1852) with these words:

When a subject is extensive and multifarious; when it has been cultivated with assiduity, but with an alternation of good and bad success; when the facts with which it deals are in a state of continual change, and, therefore, continually require new observation and new reasoning; when there prevails a great diversity of opinions as to its theoretical principles, its preceptive maxims, its application in practice, and even as to the import of its terms; when it concerns the most important interests of human life, and attracts the unceasing attention of all civilized nations; there will surely be a general agreement as to the desirableness of finding some instrument or method, by which the uncertainty of the results may be diminished, and greater stability be given to its treatment.

The characterization equally describes the situation in economics both as it appeared then and as it appears now. During the intervening years, the quest for methods by which greater dependability could be given to the results has not gone unrewarded, however. It is precisely by the development of more reliable methods of observation and reasoning that economics has advanced. By resorting to empirical inquiry aided by improved concepts and methods of analysis, an enormous expansion of economic research has been made possible. This research has changed the character of economics; it has given us a better understanding of economic processes; and it has come increasingly to be relied upon by government for the formulation and administration of public policy.

The rise of economic research, including that for policy purposes, has depended heavily on the development of intellectual apparatus suitable for analyzing, explaining, and interpreting economic affairs. The erection of that apparatus has been accomplished, not so much by validating earlier doctrines and principles with new evidence, as by multiplying and refining economic concepts and techniques. These new ideas and new methods of work have been fostered by the expanding volume of economic data, the changing form of economic activities, the emerging problems commanding attention, and the exploration of new and specialized subjects. A marked contrast exists between the methods of the last century and the more specialized approach of this. The contrast is in few places seen more sharply than in Marshall's inaugural address, "The Present Position of Economics," 1885, or in his later

address, "The Old Generation of Economists and the New," 1897 (*Memoirs*), taken on the one hand, and in *A Survey of Contemporary Economics*, edited by Ellis in 1949, and now its sequel, Volume II, edited by Haley, on the other.

The pursuit of empirical research has itself induced numerous refinements both in our methods of inquiry and in our conceptions of economic relationships. As we have put our conceptual schemes for explaining economic phenomena to the test of experience, we have been obliged to regard them more as hypothetical models. As we have learned more about the multiplicity of forces at work and the shifting institutional arrangements through which economic forces proceed and by which their results are molded, we have become less confident of simple explanations. As we have observed the buffeting that economic tendencies actually receive in the process of yielding up their consequences, we have come to speak less of causes and more of determinants and functional relationships. As we have faced the difficulties of interpreting the course of actual events, we have seen the necessity of exploring more carefully specific situations, the small sectors of activity, and the parts in relation to the whole. In consequence, our earlier quest for economic laws has waned, our principles have fallen into question, and our generalizations have become more modest and the conditions to which they apply more explicit. Increasingly our subject has become a collection of historical experience and case studies, an arsenal of models, a body of concepts, and an assortment of analytical methods. Regardless of the confidence with which such contributions are put forward, or accepted, they are subjected to tests of adequacy and usefulness and in time suffer a battered survival, revision, and reformulation or obsolescence and supersession.

Over the years, these achievements have expanded our power to interpret and direct economic affairs, but they have not been regarded as sufficient for our needs. The quest for new knowledge and more refined methods is now more active than ever before. The research suggested in the *Survey* by Haley is testimony of a restless and wholesome attempt to develop new concepts and methods, to refine the ones we have, to build useful systems of thought, and to examine more carefully both the parts and the whole, the past and the present, and the ends and the means.

As we have proceeded with economic research we have developed a growing preoccupation with questions of public policy. To a very considerable degree such research has become an intelligence service for the formulation and administration of social policy. This interest in policy questions is manifest in our economic publications, in the growing use of research by government departments, in the work of

independent research agencies, and in the studies of business, labor, and other private groups intent on influencing the policy actions of public agencies. Such are the facets of this current interest in economic knowledge for policy purposes that on the one side we find Lionel Robbins re-examining classical political economy to show—indeed with some note of insistence—that it had a theory of economic policy;<sup>1</sup> and on the other side, investigators looking forward, beyond the shocked sensibilities of their associates, to “the policy sciences.”<sup>2</sup>

This concern of economics with questions of what to do, how to do it, and why is not new, nor is it just the perversion of “scientific truth” to mundane ends. It represents a main objective for which economists have been gathering economic knowledge; namely, to help man in the management of his economic affairs. Marshall recognized this in his *Principles*. Pigou recognizes it in his *Essays in Economics* and reminds us of the economists’ desire “to help in some degree, directly or indirectly, towards social betterment.” This is not a recent waywardness. John Williams observed in his presidential address last year that “all the great theorists . . . have had policy as their central interest, even if their policy were merely laissez faire.” Robbins confirms the presence of this interest among the classical economists. He finds that their theory of economic policy was one of social reform, distinguished from others up to that time mainly in that it rested on a systematic inquiry into, and regard for, the consequences of action, “based upon a more or less comprehensive analysis of the economic system as a whole.” In France at the hands of Cantillon and the Physiocrats and in Britain at the hands of the Scots, economics passed, according to Robbins, “from a series of *ad hoc* inquiries into an analysis of general interconnexions.”

In our time, as in the past, this interest in public policy proceeds from something more than an observer’s desire to know how the economy operates and what governs its production, distribution, and consumption and its allocation of resources. The interest in policy arises from a basic desire to use economic knowledge to improve man’s economic estate. To that end it is concerned with the nature and causes of the wealth, income, and economic well-being of communities. It is especially concerned with the parts that nature, institutions, man’s deliberate arrangements, and man’s own methods have in controlling the results. For in the end, the purpose of research for policy purposes is to discover measures and to inform judgment by which,

<sup>1</sup> Lionel Robbins, *The Theory of Economic Policy in English Classical Political Economy* (Macmillan, 1952).

<sup>2</sup> *The Policy Sciences, Recent Developments in Scope and Method*, ed. by Daniel Lerner and Harold D. Lasswell (Stanford University Press, 1952). See, too, E. Ronald Walker, *From Economic Theory to Policy* (University of Chicago Press), 1943.

through human action, the organization, the direction, and the operation of economic affairs may be made to serve more effectively the economic objectives of man and society.

As to whether economics shall engage in these excursions from the sheltered paths of scientific inquiry and aid in the battles of policy making and decision, one can only conclude that the choice has been made by the course of events. Individuals may still exercise their preferences, but the commitment for the economics profession is settled. Economic affairs are increasingly organized group activities that must be directed. The direction of such affairs, both public and private, rests finally on judgment. Because of the far-reaching consequences of the decisions and the increasing complexity of the activities themselves, judgment must be aided by knowledge, foresight, deliberation, and discretion. As Nourse has observed, the direction of these affairs is coming to depend less on whim and intuition and more on analysis and broad policy. This expanded role of deliberative judgment and policy requires the knowledge and the analytical tools of the economist. The professional services of the economist are both sought and offered; and the resulting transaction is one which the economists themselves have not wholly refrained from encouraging.

The whole field of public policy is one about which we still know discouragingly little. The rapidly growing branch of economic research for policy purposes remains ill-defined and ill-developed in spite of the very considerable accomplishments to its credit. The increasing reliance placed upon research for shaping the course of economic events has implications that are yet to be studied. The role of policy and its expanding use in public and private affairs are still largely unexplored. The implications which these trends together have for economic society and for research in the future deserve investigation. We need a more thorough understanding of this field if only because of the contributions it is capable of making to statecraft and human well-being. There is, moreover, an opportunity in this area of endeavor where ideas are being tested to gain further knowledge of economic affairs and of the forces that govern them. It is with the hope of encouraging the investigation of such questions that I shall examine several aspects of research for policy making.

The term public policy, though widely used, is an elusive concept, seldom defined. Without pausing here to settle the boundary lines in debatable areas, I shall use the term to mean a settled course of conduct, or guide to action, which fixes public objectives and the means of attaining them. So regarded, public policy is an instrument by which society sets goals and, to attain them, undertakes to exercise some degree of control over certain types of individual and group conduct

without attempting a detailed supervision of the whole of such conduct. In adopting such policy a choice of strategy is made as to which social objectives shall be attempted and how they shall be sought. In this paper I shall speak only of public policy in its more evident forms as expressed formally through government. In other words, I shall speak only of legislative and executive policy and of formal administrative policy in public agencies or departments at the several levels of authority. I shall not consider the less formal types of public policy that grow up in government or that are erected by society through nongovernmental media.

In policy making, as in other matters of judgment, the closer the research analyst is to the decision-making process, the greater is his concern with those immediate specifications and considerations that make a policy proposal acceptable. This closeness to action accounts in large part for the difference between the character of research for governmental policy purposes and research of the individual scholar or the independent research agency. The governmental research analyst who assists in formulating policy proposals has obligations which the outside investigator may decline to assume.

The task of policy making in government, contrary to the representations of many observers, is not simply one of making a choice between alternative courses of action. That is the final step in a more elaborate process that now typically requires investigation and policy formulation in appropriate agencies before the ultimate choice among courses of action is made. Research for the formulation of policy conventionally provides, formally or informally, a clarification of the problem, a historical review of its background and development, and some examination of pending issues and conflicts of interest that must be considered. It also specifies a proposed course of action or, better, several courses of action, and for each an indication of how it is expected to work and what its consequences and costs are expected to be. The perplexities of the analyst arise mainly in these latter activities. They arise in his efforts to develop alternative courses of action that are technically sound, practically feasible, and reasonably economical. They arise again in his attempt to find appropriate methods for the operation of policy and again when he seeks to foresee the consequences of policy sufficiently for description and appraisal.

The policy recommendations so frequently put forward in broad outline by the independent investigator are for the government analyst only raw material. To be adopted as the essential structure of a policy that can make its way in the turbulent world of real events, such an outline must be fitted into the social, economic, and political realities of the times and protected against the uncertainties of the future.



The policy maker operates within a framework of limitations. Neither the goals he may seek nor the methods he may employ are unconditional. Both the ends and the means must be designed to fit within existing constitutional and legal limitations. They must not interfere with other policies and their objectives. They must satisfy constituents without infringing the limitations of legislative desire. They must comply with custom and meet the requirements of public acceptance. To serve the public interest, a policy must do these things within the bounds of acceptable money costs and of opportunity costs as well, for it must not undermine, obstruct, or foreclose opportunities of great importance to the future well-being of the community. In defining specifications of this sort, opinions hold sway, and differing opinions are harmonized in compromises that, however justifiable, may seriously impair the effectiveness of a policy proposal. The analyst who engages in policy formulation under such circumstances is obliged to accede to higher decision and marshal his analysis, not so much for policies that are thought to be technically superior, as for feasible policies that are capable of winning approval.

In appraising policy proposals, some estimate must be made of their consequences in an uncertain future, notwithstanding the limitations of foresight. This is a form of soothsaying from which the scholar shrinks, and yet coming to terms with such uncertainties and unpredictable contingencies is an inescapable requirement in making commitments respecting the future. For the resolution of this conflict between the necessity to foresee the future and the impossibility of doing so, man has long since found a compromise. The policy maker, like all others who make prudent commitments, builds into the commitment the flexibility and opportunities needed for adjusting to the contingencies that may arise. This he does in a number of ways. He specifies broad goals and general methods and leaves to the administrative agency the determination of the more explicit objectives and procedures that circumstances of the moment may require. He specifies conditions under which a policy becomes operable and leaves to administrators the decision as to when those conditions exist, when to act, and when not to act. He gives the administrator some measure of flexibility in introducing and enforcing the policy and he recognizes the degree to which the courts may, in light of changing conditions, interpret the act. Finally, he limits the duration of the policy to a specified period in the expectation that thereafter it may no longer be needed, or he leaves its duration unspecified in the full recognition that this means only that the policy will remain in force until changed, repealed, or superseded by the appropriate authority for reasons sufficiently convincing.

In public policy, as in other affairs, commitments are so arranged

as to be provisional without being opportunistic. They are made to proceed on accepted principles and rules of permissible conduct that reside in the character and mores of the people.<sup>3</sup> But within these limits, the commitments, if wisely designed, are never made irrevocable regardless of the changes in circumstances that may occur. Prudence in a changing world requires that into such policy commitments escape clauses be incorporated. Indeed, drafting precautions for contingencies has become a major function of the lawyer in public and private arrangements. Shrewd judgment consists in choosing not the most efficient method that can be devised for a foreseeable future but the most efficient method consistent with adequate margins of flexibility for dealing with the contingencies that may arise to interfere with or upset the activity.

When considering the probable consequences of a proposed policy, the analyst is not ordinarily obliged to lay out detailed prognostications. He uses rough approximations at best. Drawing on his sense of proportion respecting margins of error, he desists eventually from further projecting his estimates of future conditions and consequences, and turns his attention to the precautionary devices that will allow others later to adapt the policy to their times. This means that the consequences of alternative policy proposals may be quite inadequately foreseen; and yet it is on precisely such imperfect estimates of benefits and costs that judgment must finally take its stand.

The investigator outside of government has regarded the research function with respect to policy as considerably broader than it is generally regarded by the governmental research worker. The independent investigator does not consider himself bound by the limitations surrounding the policy maker in public office. In tracing out the determinants of a problem and the strategic ways of dealing with it, the independent analyst prefers to develop a technically sound solution, work it into a feasible proposal, and leave to others the task of making it acceptable. That such recommendations sometimes achieve acceptability more by their own mutilation than by their persuasion of the policy maker is to be expected.

During the past generation there has been a marked increase in the volume of recommendations for public policy based on research by independent organizations. I refer not to the formidable amount of research now done by constituent groups to advance their own points of view but to the work undertaken from the point of view of the public interest by research organizations and individuals.

<sup>3</sup> For a useful discussion of principles, interests, objectives, policies and commitments, see *Major Problems in United States Foreign Policy, 1952-1953* (Brookings Institution, 1952), pp. 373-375.

Two principal methods of translating research findings into policy recommendations have developed. Some organizations have published only the conclusions and recommendations of the author. Others distinguishing research from recommendations have used committees of men of affairs to formulate and take responsibility for policy proposals. The former practice is followed typically by the Food Research Institute and The Brookings Institution; the latter by the Committee for Economic Development, the National Planning Association, and the Twentieth Century Fund. The committee method tends on the whole to produce programs of action that come closer to meeting some of the limitations confronting the policy maker in government than do the pristine suggestions of the independent analyst. The committee method is now well established, and it demonstrates that scholars and laymen can work together in mutual respect and general agreement without destroying the independence of the scholar.

The two methods serve rather different objectives. The committee procedure is more suited to research efforts that are intended to influence policy rather directly on matters of immediate importance. The method of relying on an independent author's own findings is on the whole better adapted to matters of less urgency for which instruction rather than action is the immediate need. The committee method, particularly as practiced by the C.E.D., has had considerable influence, partly because of the caliber of the men involved, because they were available for hearings and conferences, and because they represented important constituencies. The use of this method tends, however, to orient policy research toward problems of immediate importance, toward political and economic feasibility, and toward a direct influence on legislation and policy making. These are important orientations that will offer countless problems for investigation so long as economics remains a useful guide to action.

In the over-all scheme of things, however, there remains a policy research function that is not so oriented to immediate action. It is a function that is less caught up in the rush of immediate issues, that instead can take the long view, and that affords a more leisurely examination of emergent problems. It is a research function that inquires deeply into basic issues and lines of action, that questions the postulates and results of established policy, and that explores in a more penetrating way the broader implications of policy practices. It is an activity that seeks to create informed views and to improve the climate of opinion in a world ruled more and more by judgment, human arrangements, and organized effort purposefully directed. It is an activity that will be needed so long as men must search for their bearings in the direction of affairs.

Research activities of both types will suffer no want of problems for investigation. Recent experience suggests that there may be a never ending list of urgent topics on which enlightenment will be needed for policy making purposes. Equally endless opportunities are open to the independent research institutions and universities for research on policy questions more removed from the conflicts of politics and the rush of immediate action. The further development of such economic research depends, however, not on the volume of research to be undertaken. It depends on the establishment of a better understanding of policy requirements, better methods of investigation, better standards, and a better orientation of effort.

Thus far our investigations in the field of public policy have dealt largely with policy problems in such specialized sectors as international relations, fiscal and monetary matters, agriculture and natural resources, monopoly, social security, wartime controls, and similar subjects. The full range and import of public policy are unseen in the diversity of the policies pursued. Just as the classical economists carried economics from a series of *ad hoc* inquiries into an analysis of general interconnections, so now in the realm of public policy some integrating mind is needed to frame the conceptions with which to grasp the whole and see the interconnections of the parts. When and how that will be done it is impossible to say. But meanwhile there are numerous explorations that seem likely to place us nearer that larger comprehension, and give us a better perspective for the advancement of policy and of economics as well.

The nature and function of public policy are subjects on which a number of basic investigations have yet to be undertaken. Even a preliminary attempt to grasp the role of public policy as a whole arouses an unsatiated curiosity about the origin and development of the conception of public policy itself. One of the elementary difficulties in this field is that no appropriate system for the classification of policy has been devised, and historical reviews of policy experience are available only on specialized subjects. A serious gap exists in our knowledge regarding the nature and function of public policy as an instrument and strategy of government. That public policy is used as a device for creating order in human affairs and for fostering conditions favorable for those endeavors seems evident, but the way in which it does this is unexplained. The extent to which it is an integrating device by which the activities of government at various levels are co-ordinated to serve its larger purposes needs further clarification. At each level the goals of policy are intended as means to some larger end authorized on higher authority. Administrative policy serves goals specified by Congress; Congressional policy serves constitutional objectives; and constitutional



objectives are taken to represent the desired objectives of the citizenry. But how far does such a structuring of policy into an hierarchy of co-ordinated goals and means of greater generality upwards and of greater particularity downwards brings about the co-ordination of social effort? How far does policy so organized by statecraft represent "the grand strategy of society" to which Dimock refers?

Since policies are designed to serve chosen objectives while complying with various limitations of acceptability and noninterference with other policies, it is desirable to gain a more reliable understanding of these restrictions. Is any order to be made of these limitations within which policy must be framed? How they interconnect the various policies and goals simultaneously sought needs further examination. Behind government, among the people themselves, are the more ultimate goals for which they strive and for which democratic government itself is but an instrument. What are these aspirations of people? What economic, political, and social objectives do they seek? Can any helpful order be made of them? What, at the same time, are the limiting conditions that reside in the principles and character and morals of a people and set the limits within which goals shall be sought? In what fashion may the noneconomic objectives and conditions be considered along with the economic goals? Until we have explored questions of this sort, the interconnections of public policy and the relationship of governmental means to ultimate human ends will remain obscure.

I see no way in which we can hope to deal adequately with this expanding instrument of social control unless we get on with the investigation of human objectives. I find myself echoing the words of J. S. Davis, who at the twenty-fifth anniversary of the National Bureau of Economic Research said:

One of the essential functions of social scientists is to search out and set forth clearly the ends toward which men and nations actually strive, the goals they work toward, the standards of living . . . they seek to attain and maintain. . . . When ascertained these goals may well be subjected to critical analysis, for both internal congruity and feasible improvements society would welcome if it were less confused and better integrated.<sup>4</sup>

After expressing doubt that either "full employment" or "jobs for all" was the pre-eminent goal of our society, Davis offered the opinion that "raising the standard of living" was a more valid statement of over-all goals, but even this, he explained, no one had worked through to its meaning or implications. Davis' own work—that differentiates standards and levels of living and distinguishes levels of living from levels of consumption—is an example of the penetrating re-examination needed if we are to form reliable conceptions of the economic, political, and other ends for which men strive.

<sup>4</sup> *Economic Research and the Development of Economic Science and Public Policy* (New York, 1946), pp. 180-181.



The problems of shaping public policy themselves deserve more careful study. If public policy is to be effectively used, we need to know far more than we do about the strategic factors through which, with the least effort and disadvantage, it may be possible to achieve the results intended. The strategic factors are often hidden in chains of activities through which public and private goals are sought. One does not just act to get results under modern conditions. One pursues a chain of intermediate activities step by step to their result. We operate indirectly. We are forever turning right at the highway cloverleaf in order to make a left turn. Most people no longer produce and consume, in any direct fashion; they learn a special skill, get a job, run a machine, and turn out parts for an ultimate product they do not want in order to acquire the income with which to buy the products they do want. The business firm has even more elaborate patterns of activity all deliberately designed. Society likewise has such patterns of specialized and co-ordinated effort. The policy maker must find where in such intricate chains of activity he can intercede for best results. He must then provide for the execution of his policy by organizing and establishing appropriate chains of purposeful effort. Because of these roundabout methods and the circuitous chains of intermediate steps involved, research for policy making must explore institutional arrangements and practices that formerly were considered of little importance.

These roundabout methods represent a sort of instrumentalism by which we attain our goals. The designing of appropriate chains of activities, especially for the large purposeful undertakings of government business, has become so intricate that those in authority require the aid of specialists. Research and expert knowledge have become an arm of judgment in places where decisions are made. As society becomes more specialized, more organized, more managed and directed, we must expect a growing volume of research activity close to the seats of power.

In the field of public policy, this reliance on research has already posed problems of professional responsibility and conduct for which we have as yet no accepted code. There has been a growing disposition to consider it proper for the economist to refrain wholly from giving advice, or to offer advice concerning means but not to recommend the choice of ends. These precepts may be valid, but they can hardly be taken as reliable guides to professional conduct until they have been re-examined and brought into harmony with the growing need for economic advice and with the nature of ends and means. In view of the fact that ends are so often the means to higher goals and means so generally define the intermediate objectives that serve such goals, the responsibility of the adviser is far from clear.

The role of the economist is also unsettled respecting other responsibilities. If he recommends a course of action and his superior rejects it for another of which the adviser disapproves, what is the responsibility of the adviser? Has he discharged his function, or is he obliged to furnish additional counsel respecting the course of action chosen? Is he not in the position of the doctor who looks after a patient even when the course of treatment is not followed? If the economic adviser rejects this responsibility, it will in time be assumed by some new type of middleman adviser who steps in to supply the decision maker with the advice he needs. The economist, it appears, has either to assume fully an advisory function or to play the more modest role of informing an adviser to the policy maker. On such matters practice as yet has established no custom.

The fact that such questions concerning the professional responsibility of the economist in government arise is an indication that our notions have not yet caught up with growing practice. Until we have acquired a more comprehensive and systematic view of this expanding field of activity, the relation of research to public policy and the import of that research will remain obscure. Until our explorations give us a better understanding of the nature and functions of public policy, of the goals that direct the efforts of men and nations, and of the requirements for establishing and executing public policy in all its forms, we shall fall short of that certainty and dependability of ideas and method of which Sir George Lewis spoke just one hundred years ago.

Finally, as investigation in this field proceeds we should not overlook the fact that the realm of public policy affords a sort of open-air laboratory for the study of economic processes. Economics, suffering the limitations of an observational science with little scope for experimentation, seems to have done far less than it might have done to test its concepts, methods of analysis, and even its predictions in the rough and tumble of real life. In the formulation of public policy the economist's tools are used to shape the course of events. With the unfolding of policy results, there are opportunities for seeing where foresight and analysis were confirmed by events and where they were proven invalid. In this experience are opportunities for observing, in some imperfect measure, the adequacy of the analyst's concepts and methods. Those at the controls in policy making who endeavor to manipulate economic behavior rely on their analysis and take action with liabilities. They put to test their conceptions of the determinants of economic behavior, of the strategic factors by which that behavior is controlled, of the changing setting of institutions, and of the arrangements that help to mold the course of economic life. In this laboratory, at these points of control, the consequences of action may be examined.

The expanding scope and influence of this form of social direction have undefined implications for the future of society. It has equally undiscerned implications for the future of economics. We are now witnessing but the early stages of man's attempt to use economic analysis for shaping the course of economic affairs, both public and private. It would be rash to suppose that we will not improve our capacity to use economics in this way. As we master this art, private management and public policy may become more rational, more precise and more efficient instruments, and we may gain greater control over our economic destiny. But this prospect suggests that the course of economic life will come to be governed less by the invisible hand and the force of circumstances and more by the power of informed judgment in positions of authority. The tasks of economic research under these conditions may well become more difficult. The aloofness of research will be greatly reduced. Public policy itself will become an added factor to be reckoned with among the numerous influences at work in a rapidly changing society. The problems demanding analysis are not all amenable to existing methods of work. New concepts and new methods will be required. In the end, the progress of research will depend, then, as it has heretofore, on the development of more dependable methods of observation and reasoning in the full meaning of those terms.

## DISCUSSION

HOWARD S. ELLIS: So carefully has Professor Haley ordered and analyzed the bearing of the second volume of the *Survey* upon research that comment is superfluous. Furthermore, to attempt a critique of a summary of a survey is too many removes from the actual scene. Permit me therefore to consider directly—but it will be very briefly—one or two aspects of current economics which may have been passed over a bit too hastily.

One of these is the study of the economic intentions of persons and firms. One part of this has been studied rather intensively over a period of seven or eight years by the "Likert" investigation and the Survey Research Center at the University of Michigan. The plans of consumers regarding their expenditure over the proximate and more remote future are indeed crucial in the economy; and probably this was the "logical" place to begin. In point of fact the logic which dictated beginning there was—if I am correctly informed—nothing more than the pragmatic (and, in retrospect, Machiavellian) purpose of selling people government bonds in the war. But this method cries out for much fuller use, since *ex ante* magnitudes and functions lie at the center of economic analysis, from the simple supply and demand cross onward. Hitherto, *ex ante* analysis has been largely identified with what Mr. Ruggles calls the speculative method; but there is no reason why this should continue.

Further use of the empiric *ex ante* method depends upon the development and exploitation of economical and reliable questionnaire and sampling techniques. The method, particularly if it includes individual interview of an unhurried sort, is inevitably expensive; but this need not be an absolute barrier to its extension if the techniques continue to advance, and particularly if a number of purposes can be served by one set of questions and interviews.

One of the main purposes of statistical explorations into economic intentions has been short-run forecasting, and the Consumer Finance Survey has justified its existence by the successful prediction of the shallowness and short duration of the recession of 1949. For analysis and prediction of the shorter and longer term fluctuations of economic activity, something analogous to the Consumer Finance Survey on the side of key industries in order to derive empiric production functions would seem to be the most necessary supplement. The possibility of combining *ex ante* data of this character with the method and results of input-output studies suggests itself.

This possibility leads to further reflection upon the application of empiric *ex ante* analysis to problems of "fundamental equilibrium" in various fields. In the present-day scene of extensive government intervention in economic activity we need to know more about fundamental equilibria, in the sense of what would result from choice on the part of individual consumers and producers. Knowledge of the character of equilibrium illuminates the nature of disequilibrium. For this reason, in addition to its forecasting value, empiric

knowledge of *ex ante* magnitudes and functions is important. Its extension beyond its present application to cyclical variations of consumption, saving, and investment into international trade and finance, agricultural economics, incentive taxation, and the like does not seem to be too remotely possible.

Beside the extension of empiric *ex ante* economic analysis, I would expect to see still further application—even beyond its present wide use—of the general equilibrium approach. For one thing, tax incidence has remained in a particularly rudimentary state because of its traditional partial equilibrium orientation. I have followed the formative stages of one current investigation of tax incidence in terms of the general equilibrium, and the results seem to open up entirely new and fresh vistas upon these much harassed questions. In passing, perhaps I may remark that general equilibrium thinking should be applied much more vigorously to the problem of monopoly and welfare and of monopoly and employment and to the analysis and the theory of economic development and progress.

Finally a few words upon what Mr. Ruggles calls the speculative method in economics. This appears to be an apposite designation for one segment of economic thinking; i.e., the construction of new theories or new models. It is a very narrow, misleading, and somewhat condescending sort of designation of the whole field to which Mr. Ruggles applies it. "Introspection and casual observation are relied upon to provide the substance of the analysis, and logic to provide the framework," he says. But logic does not seem to me correctly designated as speculation; and the work of ordering the various parts of economics into a consistent whole does not seem to me an incidental but a very important part of economic thinking. The task is perennial, not merely because human error is perennial, but because economics is not in large measure a cumulative science. The phenomena it explains constantly change, new theories must be invented, and the job of synthesis goes on perpetually.

"Casual observation" also appears to be a rather disdainful name for that part of economics which lies beyond econometric operation. In the first place, observation, which has to take over where exact measurement ceases, need not be casual. The observations of Smith on systems of land tenure, of Jevons upon the rapid exploitation of the British coal deposits, and of Hawtrey upon the London capital markets do not seem to me casual. And in large measure what they observed could scarcely be reduced to a statistical basis without jeopardy to the essential validity of the observations; and in large measure, also, statistical or econometric analysis would scarcely be required to establish the validity of their convictions.

For the further progress of quantitative measurement and of econometric analysis, I can only say *Crescat, vivat, floreat*. But as long as the human being remains as whimsical and multidimensional as he appears to be, the limits upon generalization from exact data will remain severe. That is the reason why economics is probably more difficult intrinsically than nuclear physics. Judgment must enter. But there is such a thing as good judgment—judgment which rests upon maturity, breadth of view, and a keen apprehension of the fact that economics is a social, not a natural, science.



ALFRED C. NEAL: As one whose first profession is (or was) that of economist, I have become increasingly concerned about the fact that practicing economists in business and finance are paying little or no attention to the activities of the American Economic Association or its publications.

Meetings of most other professional associations are well attended by practitioners in business—e.g., chemists, accountants, attorneys, personnel managers, etc.—and it is my impression that the journals and proceedings of other professional societies are reasonably well regarded by members employed in business. Why is this not so in the case of business economists?

Outside of academic circles, one encounters little comment on anything in the journals of economics (as distinguished from the journals of business) and almost any such comment is derogatory. Why?

Each year when the Association holds its meeting, I watch the newspapers for the kind of coverage the meeting gets. With few exceptions, the small coverage consists of a scattering of high lights which convey nothing of the scope and depth of the discussions. Many a speech before a trade association on an economic subject by a not-too-well informed businessman gets better coverage! Why?

If the product of economists were given the same consideration as to effectiveness as the product of a commercial organization, or even of many a nonprofit institution, the state of affairs just described would result in heads rolling.

May I suggest a few lines along which answers to my questions might be found? Businessmen do not pay much attention to the Association's type of economic research (i.e., that published by the Association) because it is not, or is not believed to be, significant to business. If academic economists—whose views are governing in the Association—want to do something that is significant to or for business, they usually study some problem of the business firm. The concept of the firm and of the problem is that of the economist, not the businessman. Such studies are ignored almost as impartially as other economic research. To the extent that such studies are ignored, doubt can be raised as to the interest of business in the studies.

Is it that business is just not interested in any kind of economic research? That question poses a research project itself, along with some problems of definition which I shall ignore. My guess is that business spends on economic research far more than all the academic institutions combined. Economic research by business is not only substantial; it is expensive. It includes: various statistical and forecasting services, at a cost of from several to several thousand dollars a year; sales and market analyses, plant location studies, a variety of internal controls, wage, salary, and labor market studies, analyses of probable government policies and of proposed legislation, tax studies; in the larger concerns, an economist or several economists; and a surprising amount of the time of top executives. Does anyone care to undertake a survey of the size of the business market for economic research?

If you will admit my point that there is a large potential business market for economic research, then we can come back to the question why the Association has tapped so little of that market. Surely it is reasonable that the uni-

versities should undertake much research that is not of immediate interest to business; that is the great strength of the universities. But is it equally valid that the Association should pursue a program that attracts so little interest from business? Most economists will recall that their own profession only a few decades ago conscientiously excluded ideas which are today dominant within the profession. Is it possible that the profession today is equally inhospitable to other ideas, other concepts of what economics is and what it should do, originating outside its ranks?

If there is a great potential interest in economic research in business that is not being tapped—as I believe there is—then the Association has some rather clear-cut tasks to perform unless it wishes to become an association of college teachers of economics.

To begin with, the significant questions or lines of economic investigation of interest to the business community should be ascertained, preferably by a committee of the Association. How? Not only by the analysis of literature but by talking to businessmen, lots of them. An interesting by-product of such an investigation might be some notion of the number of people and the amount of expenditure devoted by business to economic research. The fact that such an investigation would pose almost unanswerable questions of definition and scope should not deter it; economists do not hesitate to tackle equally difficult problems relating to the dynamics of the economy as a whole.

A second major line of investigation should be undertaken in the field of communication of ideas by economists. Is the profession adept at conveying its findings to a larger public or does it communicate primarily to economists? I was shocked to learn that at the meeting of the Association in Boston last year no participant in the program used any visual or other aid to communication that has not been available for more than half a century. In the era of animated cartoons and television, should economists be content with black-board geometry and verbalization? I was also surprised to learn that in this age of the art of public relations, economists had not yet learned the value of the advance copy and that they abhor the press release as much as they adore the polysyllable.

Economists have a major public relations problem. That problem is a part of the larger problem of making economic research a matter of greater current significance to business. If that problem is solved, the further problem of obtaining funds for such investigations as I have proposed and for economic research more significant to business will become a matter of minor difficulty.

To sum up: Economic research will become more significant to business in proportion to the extent that economists stop talking only to each other.

MILTON FRIEDMAN: The authors of the papers in *A Survey of Contemporary Economics* had the assignment of evaluating the present status of various fields of study in economics, including the status of research and the directions future research should take or is likely to take. The authors of the papers at this session—or at any rate Professor Haley—had the assignment of evaluating the evaluations of the *Survey* authors. And I suppose my assign-

ment is to evaluate the evaluations of the evaluations of the *Survey* authors—so I am at least three stages removed from actual research.

I wonder if this long chain is not symbolic of one of the chief problems in current research in economics and other social sciences: the growth of an elaborate institutional structure for promoting, furthering, and financing economic research. The essence of scientific research is that it is exploration into the unknown. Its planning, encouragement, and financing involve the kind of paradox that Frank Knight is wont to illustrate by the problem of choosing a physician. If a man knew enough about medicine to judge a physician's medical qualifications adequately, he clearly would not need a physician. How then can he make the choice at all intelligently? We answer this paradox by choosing a man on the basis of evidence other than his ability to resolve our particular difficulty: his intelligence and ability in areas in which we are competent, the judgment of other physicians, and so on. We proceed on the hypothesis that this evidence is relevant to his ability to cure us and, having chosen him, we proceed to give him a great deal of freedom to tell us what to do. This analogy carries over precisely into research. If we really knew enough in advance to know that a particular piece of research is worth doing, it would be unnecessary to do the research. How then can we choose among research projects? Again, we can—and, in my opinion, should—proceed on the basis of independent evidence about the capacity of the research worker: his performance in the past and the judgment of his peers. Again, we should proceed on the hypothesis that if this evidence is favorable, it establishes a presumption that he is a good bet for the future. Again, having selected him, we should give him a great deal of freedom in telling us what to do.

Of course, the paradox can easily be overstressed in research as in medicine. Much research involves the collection and development of basic information of a kind suggested as significant by the past results of research; or the application of existing ideas and techniques to new problems. The paradox is most relevant to what may be called basic research in constructing and testing new hypotheses; and partly because it is, this is precisely the kind of research that tends to get buried under the elaborate plans and programs for other types of research.

The list of research projects extracted by Haley from the *Survey* has great value in suggesting possible areas of work to economists and bringing to them the considered judgment of a group of "experts" about the problems in their own fields that deserve and require further analysis. It would be a serious mistake—and here I am echoing Haley's own warnings—to take them as a blueprint for future research or for the appropriate allocation of research funds. And it would be an equally serious mistake to suppose that any such blueprint exists or that time can usefully be spent in trying to construct one.

In view of this attitude toward "projects" I shall eschew the temptation to comment on the particular research projects listed by Haley or to add my own favorites to the list. Instead, I shall list what seem to me at this time some of the chief needs for rapid progress in economic research and the difficulties in the way of satisfying them.

The first and by all odds most important need seems to me to be for able

men, interested in adding to our knowledge about economic behavior, free to follow their own interests wherever they lead, and with sufficient resources to do so. The initial difficulty in the way of satisfying this need is, of course, the scarcity of able men in the world in general and the difficulty of attracting them to economics in particular. But about this difficulty there is little we can do directly; we can contribute most to easing it indirectly by improving the conditions for research of the men already in the field. Here the chief difficulty is, I fear, the one already referred to: the tendency to allocate research resources on the basis of projects rather than to men and, more serious yet, the tendency for donors of funds to believe that they should themselves determine what projects should be undertaken and then seek the men to undertake them. This is, of course, a manifestation in this particular field of the general trend toward a belief in centralized control and planning. It is important, it is believed, to have a co-ordinated plan and to avoid duplication. Far from it. In this area, we want more and better duplication; for really new ideas are likely to arise only if a number of people comb the same area from somewhat different points of view and with different insights and interests. Competition has its place in economic research as in the market place.

The emphasis on projects and co-ordination tends to divert able men from the pursuit of their own interests or to deny them resources and to waste the time and energy of the abler men both in dreaming up projects that will be attractive to donors and in supervising the activities of less able people on projects they ought not to be working on. Fortunately, such perverse effects are likely to be limited. Scholars are pretty tough, and the ablest are likely to follow the bent of their interests no matter what. In consequence, a large part of the effect of emphasis on projects of a particular kind will be on the wording of the requests for assistance rather than on the content of the work done.

A second need is, in my view, a sharp separation between positive economics—study of what is—and normative economics—study of what ought to be. And here I believe I differ from the view expressed by Dr. Calkins, if I have understood him rightly. I do not deny that both are appropriate fields of study and can be part of the science of economics, nor do I deny that economists can make an important contribution to the determination of public policy. But I do feel that progress in economics will be much faster and surer if these two branches of economics are kept sharply separate. Positive economics is in principle capable of being an objective science like physics or astronomy. Its role is to enable us to predict the consequences of doing one thing rather than another or of having one thing happen rather than another. When we go on to ask whether these consequences are desirable or not we are entering the realm of normative economics, whose links are with ethics and philosophy. Confusion of the two branches of economics leads to confusion about the criteria for judging the validity of particular propositions. There is an inevitable tendency to accept or reject propositions in positive economics according as their conclusions do or do not agree with our normative preconceptions rather than according as they yield predictions



that are or are not confirmed by experience. The difficulty in the way of a sharp separation is, of course, the great prominence of economic issues in public policy.

A third need, quoted by Haley from Ruggles, who in turn quoted from Neumann and Morgenstern—so you can see a quadruple (or is it quintuple) play developing—is for a willingness of economists to work on unimportant problems. Economics can be and remain a cumulative science only if little bits and pieces can be done right, so that they can serve as firm bricks on which to rest the structure. The difficulty here, of course, is that there are so many significant problems in economics, and it is so hard to resist the temptation to work directly and immediately on these significant problems. This difficulty is accentuated by the failure to separate positive economics sharply from normative economics, which is a major reason for urging such a separation.

The final need that I want to mention is for somewhat more methodological sophistication about the grounds on which an economic theory is to be accepted or rejected. The point I have particularly in mind is the meaning of a "realistic" theory and the confusion between what might be called descriptive realism and analytical realism. One of the most common criticisms of orthodox price theory, for example, is that its "assumptions" are "unrealistic," in the sense that the hypothetical consumer or firm envisaged by the theory is not a slavish reproduction of the actual consumer or firm. "Realism" in this sense is largely irrelevant to the worth of a theory. The important thing is that a theory be "realistic" in its predictions, not in its assumptions; and the only way in which a theory can be tested adequately is by comparison of its predictions with observation. Confusion about this point has been productive of much mischief, both in causing unnecessary controversy about and misunderstanding of elements of economic analysis and in producing an overemphasis on certain types of research.

ARTHUR R. UPGREN: Dr. Robert Calkins has made a forceful case for the use of economic research to develop recommendations for economic policies "in the here and now." I heartily endorse his view.

"The scholar's work must have relevance." That phrase stands out in my memory of an old biographical sketch of President James B. Conant, of Harvard University. Thus did an outstanding leader in the natural sciences declare that the research worker's task is to promote the general welfare. President Conant's feelings in this respect were emphasized in an observation to the effect that research work which leads to an unusual collection of footnotes is merely another form of escapism comparable with stamp collecting.

This point of view, I think, is fully sustained by the present position of the American economy.

There has slowly come to pass a reasonably peaceful revolution in that part of the world friendly to the United States. It is a revolution away from that devotion to planning which captured so much politician allegiance in the thirties and has a hangover in perennial full employment policy declarations by scholars in the forties. These declarations continued long after the men mak-



ing them should have seen that the conditions of the thirties had been reversed and that a condition of overfull employment was the new dominating feature of the day.

This revolution achieved political significance in the United States last November.

Whether economists and other students of business like it or not, they are now under obligation to help develop the policies which will direct our economy according to November's mandate for greater economic freedom. They are under a mandate to assist in discussing and formulating policies which should be proposed for the Eisenhower administration.

This does not mean that the principles of economics are either Republican or Democratic. It does mean that parties having central planning as their center of gravity in economic freedom have been selected for leadership. Dr. Calkins has put his view in much less controversial form, but perhaps striking this note will underscore and make clear my understanding of the import of his paper.

I believe economists have a further obligation. To illustrate it, let us go back to another biographical sketch, one written about Secretary of State Dean Acheson shortly after his appointment. This biographical and character interpretation sketch concluded on the note that here was a man who believed it is sufficient unto the day to have democracies settle their problems as they arise, whether they arise in orderly or disorderly seriatim.

The biographer—perhaps without full awareness of the import of his words—added that time alone would tell whether it is safe, given the ideals of America, to settle each problem by the best light of the day in which it happens to be discussed. He admitted there might be a chance that this kind of pragmatism could, through such impromptu decisions, crystallize the economy in a form quite different from what was wanted by the sovereign people when they expressed their will.

The gold clause decision of 1935 is an illustration of such a development. The court then disturbed economists momentarily when, by the innuendo of its questions, we were brought to believe the Gold Reserve Act might be declared unconstitutional. If that had occurred, retracing our gold policy steps might have been extraordinarily complicated and difficult if not impossible.

So it is my view that we must determine—and this is the most difficult decision—whether taking daily decisions is not a more dangerous course than developing an economic philosophy, something in the manner of a definite “constitution,” so that our views will be crystallized with regard to what we should accept and what we should reject if we are to preserve the type of economy we want in the United States.

What “we want” must be tested by the degree of welfare obtained.

I have just read a paper prepared by Dr. Miles Colean for the American Finance Association meeting. It reveals how policies designed in the thirties to help rescue our homes and insure mortgages in the housing industry have in fifteen years been converted into “socio-welfare” proposals. These now have the federal government determining what housing is to be produced

and doing so in very particularized detail for different groups ("to each according to his need").

It is my view—and this is highly controversial—that economists must develop a central framework for our philosophy—a framework by which we do test the policies we adopt or reject. This is indeed a great task, probably greater than that envisaged by Dr. Calkins' paper. But if we do this task well, economics will be neither New Deal economics nor Republican or laissez faire economics. Doing this task well can advance our profession, and the problem must be understood by the government servants in economic positions in Washington.

## LONG-RUN EFFECTS OF FULL EMPLOYMENT ON THE LABOR MARKET

### WAGE LEVELS UNDER CONDITIONS OF LONG-RUN FULL EMPLOYMENT<sup>1</sup>

By ALBERT REES  
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The effects of full employment on wages have been much discussed during the past decade. This discussion has generally assumed that full employment means more or less the same thing to everyone. It has not emphasized sufficiently that the behavior of wages under long-run full employment depends largely on how full employment is defined. Under some definitions, wages and prices would rise rapidly; under others, wages would rise very gradually and prices would be stable.

The most widely accepted definition of full employment is that of Sir William Beveridge, who means by full employment "having always more vacant jobs than unemployed men."<sup>2</sup> This concept has received powerful support from a group of experts appointed by the Secretary-General of the United Nations to study full employment policies. The members of this group were John M. Clark, Nicholas Kaldor, Arthur Smithies, Pierre Uri, and E. Ronald Walker. They define full employment as "a situation in which employment cannot be increased by an increase in effective demand."<sup>3</sup> Although their definition and Beveridge's are stated differently, the practical effect of the two would be the same. Clearly, employment can be increased by increasing effective demand beyond the point at which the demand for and supply of labor are evenly balanced at existing wages.

To guarantee full employment as defined by Beveridge or the United Nations experts would cause wages to rise faster than the long-run rise in productivity. It would, in a word, cause inflation. This inflation could be suppressed in the short run, but not indefinitely.

It has become a commonplace to observe that a full employment guarantee of the Beveridge type may be dangerously inflationary. However, this is generally believed to be true solely or primarily be-

<sup>1</sup> I am indebted to my colleagues D. Gale Johnson and Frederick H. Harbison for helpful suggestions.

<sup>2</sup> William H. Beveridge, *Full Employment in a Free Society* (W. W. Norton and Co., 1945), p. 18.

<sup>3</sup> John M. Clark *et al.*, *National and International Measures for Full Employment*, Report by a group of experts appointed by the Secretary-General (United Nations, 1949), p. 13.

cause of the bargaining power of labor and other organized economic groups. This view has been expressed both by writers who favor trade unionism and those who oppose it; by both those who favor and those who oppose the Beveridge program. In this context, it has seldom been remembered that the demand for labor is a derived demand, and that the excess demand for labor required by the Beveridge definition can be created only by creating simultaneously an excess demand for commodities. The resulting wage increases will be as much a consequence as a cause of price increases. Such wage and price increases would take place most rapidly in perfectly competitive labor and product markets. They would tend to be delayed or suppressed by the rigidities of collective bargaining and administered prices.

There is considerable evidence that in the United States collective bargaining tends to retard wage increases when strong inflationary pressures are present. Since this evidence and the reasoning supporting it have been presented at length elsewhere, I shall summarize it very briefly.<sup>4</sup> One kind of evidence is provided by comparisons between wage movements in unionized and nonunionized sectors of the economy. These show that since 1939 most of the nonunionized sector has had relative wage increases equal to or exceeding those of the unionized sector. Other evidence shows that many recently unionized industries fared worse relative to all manufacturing during the present inflation than they did during previous inflations before they were unionized. Collective bargaining in this country produces these results primarily because it sets wages for a fixed period of time in most cases. It therefore reduces upward wage flexibility.

American economists are less familiar with the relevant evidence from Sweden, which is the more important because it is of a different kind. Sweden is so highly unionized that little can be learned by comparing the unionized and nonunionized sectors of the economy. Instead, one must compare the movement of union rates with that of average earnings under conditions of full employment. Professor Bertil Ohlin writes: "Experience in Sweden and other countries seems to indicate that while large firms experience difficulty in finding the needed labor force, small firms can expand because they are in a position more or less secretly to pay wages above the level fixed in the collective agreements."<sup>5</sup> Ohlin reports that the increase in the average weekly earnings

<sup>4</sup> See Walter A. Morton, "Trade Unionism, Full Employment and Inflation," *American Economic Review*, March, 1950; Milton Friedman, "Some Comments on the Significance of Labor Unions for Economic Policy," in D. M. Wright, ed., *The Impact of the Union* (Harcourt, Brace and Co., 1951); and Albert Rees, "Postwar Wage Determination in the Basic Steel Industry," *American Economic Review*, June, 1951.

<sup>5</sup> Bertil Ohlin, *The Problem of Employment Stabilization* (Columbia University Press, 1949), p. 15.

of Swedish industrial workers in 1946 has been estimated at 8 per cent. Of this, about half was due to increases in union rates and the other half to various forms of "overpayment." Mr. Gösta Rehn, an economist for the Swedish federation of trade unions, has informed me that since Ohlin's book was written, average earnings have continued to increase faster than union rates. Swedish trade unionists call this phenomenon the "wage slide."<sup>6</sup>

The Swedish case is significant because, by the standards of Beveridge or the United Nations experts, the Swedish labor movement has been a very model of proper behavior. Writers sympathetic to both trade unionism and the Beveridge program have expressed the hope that unions would be moderate in their wage demands. They have usually advocated the centralization of wage bargaining to further this moderation by eliminating competition between unions for wage increases. These suggestions have sometimes been criticized as unrealistic. (See, for example, H. W. Singer, "Wage Policy in Full Employment," *Economic Journal*, December, 1947.) In my opinion, the criticism is valid for the United States and Canada, for there is little reason to expect that in the foreseeable future American unions will submerge longstanding rivalries and pursue self-sacrificing wage policies. This is especially true since—with the notable exception of the United Mine Workers—these unions have failed to keep pace with the inflation while seeking wage gains vigorously.

For the Swedish and British unions, however, early critics of the Beveridge position were probably premature. They underestimated the willingness of these unions to give up traditional aims in the short run. In the interests of the full employment program and in the interests of governments conducted by labor's own political parties, these unions have refrained from demanding higher wage rates.

In the long run, however, the position of the Swedish and British unions is likely to change. Why should unions continue to hold down wage rates while average earnings increase? Can they long afford to permit employers to receive the credit where earnings rise and to take

<sup>6</sup> Since this paper was presented, I have received from Mr. Rehn some recent statistics on the wage slide. The total increase in the average hourly earnings of men in Swedish manufacturing industries from 1939 to 1952 was 189 per cent. Of this, almost one-third cannot be accounted for by contractual wage increases, including cost-of-living allowances, or by the movement of workers from low-wage to high-wage industries. For women, the total increase was 220 per cent, one-fourth of which seems due to the wage slide. In each year since 1946, the wage slide equalled or exceeded 3 per cent of the initial average hourly earnings for both men and women; from November, 1951, to November, 1952, it was 7 per cent. Some part of the wage slide may be caused by the movement of workers from low-wage to high-wage firms within industries or by changes in the age distribution of the work force. However, most of it is attributed to such causes as *sub rosa* agreements between employers and local unions, unilateral employer wage increases above contract levels, and loose piece rates. Mr. Rehn's data can be found in *Levnadskostnader och löner 1939-1945-1952* (Stockholm: Landsorganisation, 1952).



the blame themselves where they do not? Such a position invites the formation within the labor movement of opposition to established leadership. This opposition might merely reaffirm the unions' historic role. More likely, it would be led by communists, using old slogans for their own ends.

It is thus understandable that sentiment against the continued existence of excess demand is appearing within the Swedish labor movement. Mr. Rudolf Meidner, an economist for the Swedish unions, writes: "There is no organization whose very existence is threatened to the same degree by this excess demand as is the trade union movement which must maintain its dominant position in the wage-formation process if it wants to survive."<sup>7</sup>

To avert inflation under full employment conditions, it is frequently proposed that wage policy should limit the rise in wages to a rate equal to the long-run rise in productivity. This rate is usually estimated at 2.5 to 3 per cent a year for the United States. The proposal is appealing because it is immediately obvious that this wage behavior is compatible with price stability. What is not at all obvious, however, is why this behavior of wages must be achieved by the use of "wage policy"; that is, by direct influence on or control of the wage determination process. Why should the rate of increase of wages not be limited indirectly by monetary and fiscal policy? The answer must be that monetary and fiscal policy are to be committed to goals inconsistent with the desired behavior of wages.

It is not easy to state a wage policy which would be appropriate. Clearly, it will not do to have all wages rise at the same rate. In the first place, this would perpetuate any inequities embedded in the initial wage structure, such as might be caused by monopsony or by excessive union rates for certain jobs. Secondly, this would not provide for changes in the wage structure made necessary by different rates of technological progress in different industries, by changes in consumer tastes, and by changes in the occupational preferences of workers. When there is considerable unemployment, wage structure can remain static for long periods. Where more workers are needed, they can be drawn from the unemployed at prevailing wages. Under full employment, however, wage structures must be more flexible. Either wage inducements must be offered to attract workers where they are needed or there will be serious permanent inefficiency in the use of resources.

This problem has been recognized by Professor Abba P. Lerner, who offers an ingenious solution for it. He proposes to compute an "index

<sup>7</sup> Rudolf Meidner, "The Dilemma of Wages Policy Under Full Employment," in Ralph Turvey, ed., *Wages Policy Under Full Employment* (London: William Hodge and Co., 1952).

of relative attractiveness" for each occupation, obtained by taking the number of qualified workers who want to work in the occupation at existing wages and dividing it by the number employed. Where the index is sufficiently high, indicating an oversupply of labor for the occupation, wages are to be frozen; where it is sufficiently low, indicating an undersupply of labor, wages are to rise twice as fast as the national average (*Economics of Employment*, Chapter 14). As a practical matter, however, it is virtually impossible to determine how many workers, including those already working elsewhere, want to work in an occupation. Even frequent enumeration of the unemployed by their last occupation and location would require a vastly expanded system of labor market reporting. Lerner's indexes would provide at best an extremely crude and inefficient substitute for the continual delicate adjustments of wage structure made by free labor markets and free collective bargaining.

Both Lerner and the United Nations experts hope to implement their wage policies through persuasion; both are vague about what to do if persuasion fails. The United Nations experts call for some entirely unspecified "action" in this event. However, they are explicit about what not to do. They say that "it would be inappropriate for any country to pursue policies having the effect of raising unemployment above the level resulting from seasonal and frictional causes, merely in order to restrain upward pressure on prices." (*Op. cit.*, page 45.) In other words, inflationary tendencies should not be combated by removing the underlying inflationary pressures.

It seems clear that wage policy is thought of as one weapon in an arsenal of weapons for suppressing inflation. The advocates of the Beveridge program have almost always preferred suppressed inflation to open inflation. They have often advocated price controls, exchange controls, and price subsidies. Surely they should be as forthright with respect to unpopular wage controls. If their program may require permanent wage controls, then unions, management, and the public have a right to know it. It is difficult to see how their wage policy could be maintained without formal controls in the face of excess demand. Even if unions can be persuaded to be "moderate," how can small employers be persuaded not to bid for the labor they need?

The preference for suppressed rather than open inflation in the full employment literature is so pronounced that few writers bother to defend it. This is puzzling, for suppression has high costs: inefficiency in the use of resources, the destruction of economic incentives, serious difficulties in the balance of international payments, and even the undermining of respect for law. Moreover, these costs are paid in vain, for sooner or later suppression must fail. If there is a contin-

ual excess demand for labor, earnings will eventually rise. There will be violation of the rules, irresistible pressures to amend the rules and to interpret them loosely, and widespread use of such devices as upgrading, the relaxation of piecework standards, and excessive overtime work. Employment benefits other than money wages will increase, and average earnings will rise as labor gravitates toward the best-paying jobs.

It is an illusion to believe that excess demand can be reconciled with price stability; there is a basic inconsistency between these aims which cannot be blamed on organized labor.

In my opinion wage behavior consistent with price stability can only be obtained through an appropriate fiscal and monetary policy. When the pressure of market conditions on employers and unions produces the desired wage behavior, wage controls are superfluous; when it does not, they are futile.

An appropriate monetary and fiscal policy is implied in the definition of full employment given by Professor Ohlin. His definition differs sharply from that of Beveridge because it is consistent with price stability. Ohlin means by full employment "the degree of employment that exists when the aggregate demand for commodities is at the highest level that is compatible with the condition that demand at existing prices is balanced by current domestic supply." (Ohlin, *op. cit.*, page 5. The word domestic precludes obtaining the necessary supply from abroad by means of foreign credits or the depletion of gold and foreign exchange reserves. The word current precludes obtaining it by drawing on inventories.) This definition would permit a rise in wages roughly equal to the long-run rise in productivity. In Ohlin's terminology, the definitions of Beveridge or the United Nations experts produce a state of "over-full employment."

What Ohlin has done is to make price stability the guide to monetary and fiscal policy, but to translate the price rule into its employment equivalent. This is justified in view of the present deep and proper concern for employment stabilization. It points out dramatically that a price-stability policy is in itself a guarantee against mass unemployment.

Followers of Beveridge will object that the Ohlin rule in effect abandons the full employment goal. Their fears would be justified if the price-stability policy were put into effect at a time of widespread unemployment. High levels of employment could not then be restored without some price increases; it is in this context that there has been so much discussion of bottlenecks and rising marginal-cost curves.

However, applying a price-stability rule starting from a period of high-level employment would permit unemployment only slightly

greater than the amount consistent with the Beveridge definition. For the United States, the recession of 1949-50 will serve as an example. The maximum unemployment during this recession was 7.4 per cent of the total labor force; in fifteen months unemployment was above 5 per cent of the labor force and in four of these it was above 6 per cent. However, during this period the Consumers' Price Index fell 7.3 points or 4.2 per cent from its 1948 peak and wholesale prices fell considerably more.

Thus the application of a price-stability rule as a guide to monetary and fiscal policy would have kept unemployment below the levels actually reached in 1949-50. It seems that, given the present structure of American markets, a price-stability rule is unlikely to permit unemployment to exceed 5 per cent. This figure could, of course, be lowered by successful measures to increase the mobility of labor and improve the organization of the labor market. We can also further reduce the social costs of unemployment by improving our system of unemployment insurance.

The United Nations experts have stated that under their definition of full employment, 2 to 4 per cent of the labor force would be a reasonable allowance for seasonal and frictional unemployment in the United States. (*Op. cit.*, page 14.) The question thus becomes one of whether or not it is desirable to lower their full employment goal by 1 or 2 per cent of the labor force to permit a successful anti-inflationary policy. I believe that this is desirable. The leaders of organized labor may come to agree once they understand the implications of overfull employment for the freedom of collective bargaining.

A proposal to alter the full employment goal by 1 or 2 per cent runs two dangers. One is that the change sounds small and therefore may not be considered worth bothering about. It must be emphasized that a small change at this strategic point would have great effects on the movement of prices and wages. The other danger is more important. It is the understandable reluctance to change in any way goals which have come to mean so much as a result of the depression of the thirties. However, in defining the goals of public policy it would be as irresponsible to fail to take into account the experience of the past decade as it would have been in the early forties to ignore the experience of the depression. By this I do not mean that the pendulum should swing back to pre-Keynesian concepts of public policy. Rather, we must seek a new synthesis which preserves as much as possible of the best in all our past thinking. The energies which have been fruitlessly absorbed in wrestling with the problems of overfull employment and suppressing inflation can be released and used to move forward in new directions.

## IMPACT OF EFFECTIVE DEMAND ON THE LABOR SUPPLY

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### *Introduction*

No keen insight is required to characterize the thirties as a decade of preoccupation with demand and no sharp foresight perhaps to suggest that the fifties will be one of concern over supply. There lies ahead an era of planning, of input-output tabulation, of national income accounting and projection—calculations for which the size, the quality, the hours, the mobility, and the effort of the labor force are paramount. This would be so even in peace. But the chances are that war—in some degree of temperature!—will be with us for the next generation and that, except for occasional lulls, the atmosphere and the competitive obsolescence of armament it fosters will mean high employment and money income, far-flung military forces, and great pressure on the labor supply.

This not entirely agreeable prospect gives new point to an old question: will high effective demand cause more or less labor to be forthcoming and by how much?

The various attempts to deal with this problem have yielded several hypotheses. One tradition, well established in economic learning, is that *homo laborans* is a sloth who works mainly from hunger. Give him a wage above the bare necessities of life and, on the principle of diminishing marginal utility, he will be sure to squander some of it on surcease from honest toil. Marshall, it is true, held a candle into this gloom with the dynamic view that "an increase of wages . . . almost always increases the strength, physical, mental and even moral of the coming generation; and, other things being equal, an increase in the earnings . . . by labor increases its rate of growth; or, in other words, a rise in its demand price increases the supply of it. . . ."<sup>2</sup> But the belief

<sup>1</sup> I am deeply grateful to my assistants, Margaret Chen and Susan Dischka, to my colleague, Professor Acheson J. Duncan, and to Marc Nerlove and James Terrell, of the Department of Political Economy, for their help in developing the statistical computations underlying this paper.

<sup>2</sup> *Principles of Economics* (4th ed.), p. 603. Frank Knight, in *Risk, Uncertainty and Profit* (p. 117), explained that one of the commodities labor purchases with increased earnings is leisure; and W. Stanley Jevons, in *Theory of Political Economy* (4th ed., pp. 180-181), that "English laborers enjoying little more than the necessities of life, will work harder the less they produce; or . . . will work less hard as the produce increases. . . . The richer a man becomes, the less does he devote himself to business." These remarks refer, strictly speaking, to hours or effort, but they can be extended to labor force.



that the labor supply was necessarily backward sloping tended to prevail until Lionel Robbins showed it was based on failure to take account of the elasticity of demand for income in terms of effort. (See "On the Elasticity of Demand for Income in Terms of Effort," *Economica*, 1930, pages 123-129.)

Until the thirties the effects of wages or incomes on labor supply were considered without regard to job opportunities. The depression drew some economists, notably Woytinsky, to the additional worker theory: that unemployment of husbands or fathers would force many dependents into the market as distress job seekers.<sup>3</sup> Not everybody agreed, however, as to what conditions brought in additional workers. Another school held with J. H. G. Pierson that "if society were committed to providing job opportunity for all those able and wanting to work, however numerous, certain fresh supplies of labor not apparent at present would shortly be uncovered. . . ." (*Full Employment*, pages 18-19, Note 22). One writer has even found it plausible to expect a rise in the labor force in both depression and prosperity.

In the meanwhile, Keynes had entered the depression discussion with his now well-known postulate that below full employment "a situation where labour stipulates (within limits) for a money wage rather than a real wage, so far from being a mere possibility is the normal case" (*General Theory*, page 9), thus suggesting that labor reacts very differently as between full and less-than-full employment conditions and that under the latter circumstance it varies directly with money wages rather than inversely with real income.

These problems cannot, of course, be dealt with adequately in a short paper. The present one summarizes some rather detailed investigations into the size of labor force under short-term changes in wages, incomes, unemployment, and military strength. It relies mainly on the experience of the United States, Canada, and Great Britain (since these three nations began to make available annual, quarterly, and monthly statistics); but it benefits also from researches with decennial census data of a half century or more in five countries, including New Zealand and Germany. (See "Labor Force, Income and Employment," National Bureau of Economic Research, 1950, mimeographed, now under extensive revision; also "The Labor Force and Economic Change," *op. cit.*, pages 329-355.)

<sup>3</sup>W. S. Woytinsky, *Additional Workers and the Volume of Unemployment in the Depression* (Social Science Research Council, Pamphlet Series 1, 1940), pp. 1, 17, 26; D. D. Humphrey, "Alleged 'Additional Workers' in the Measurement of Unemployment," *Journal of Political Economy*, June, 1940, pp. 412-419; Woytinsky, "A Reply to Mr. Humphrey," *ibid.*, October, 1940, pp. 735-740; C. D. Long, "The Concept of Unemployment," *Quarterly Journal of Economics*, November, 1942, pp. 9-10; "The Labor Force and Economic Change," in *Insights into Labor Issues*, ed. by R. A. Lester and J. Shister.

*The Labor Force*

The concept of labor force varies in some degree among the countries, without, however, invalidating analysis of short-run change. (The revised manuscript mentioned above contains a detailed critique of variations in the labor force concept, both over time and between five countries.) In general, it includes the unemployed—those seeking jobs and able and willing to work (presumably for going wages)—and the employed—wage and salary earners, employers and own-account workers, military and civilian personnel of government. It excludes students and housewives (as such) on the ground that though they undoubtedly toil and spin, they get no pay and therefore have no economic standing.

My past inquiries have led to the following conclusions:

1. At any time, the labor force seems to vary inversely with real wages and salary earnings of adult male workers, even when account is taken of differences in color, nativity, marriage, child responsibilities, education, employment opportunity, size of city, density of rural population, or length of work week.

2. Over long periods, between high-employment census dates, the labor force has manifested no such association. It has, in fact, held to a proportion of the over-all population (standardized for composition) that has been remarkably stable,<sup>4</sup> especially in view of the great changes in real or money hourly earnings, in disposable incomes, and in the internal composition of the labor force itself.

3. There was no net influx of desperation work-seekers in the great depression and therefore no flight from gainful labor in the subsequent recovery. Actual decreases of 2 per cent of population obtained for Great Britain in depressed 1921 and 1931, for Germany in 1933, and for the United States and its individual states and cities at various dates during 1934-40. With the peacetime prosperity, the labor force went back up to the proportions prevailing in previous years of high employment.

4. These findings refer to peacetime. My *Labor Force in War and Transition: Four Countries* has concluded that, except in Germany, where no additions of natives were realized, the very large World War II labor force inflows were dominated by the military draft and, aside from normal growth, turned out to be temporary.<sup>5</sup>

<sup>4</sup>A criterion of stability may be had in the fact that the long-run changes in the proportion of population in the United States labor force have been smaller than the variation within any year between winter to summer, and at the same dates, e.g., April, 1950, between the labor force reported by the Census Bureau's regular decennial enumeration and that estimated by its monthly survey based on a sample of 25,000 households. See my "Statistical Standards and the Census: Discussion," *American Statistician*, February, 1952. See also in that issue the remarks of Morris Hansen, Assistant Director of the Census, pp. 10-14.

<sup>5</sup>*Occasional Paper 36* (National Bureau of Economic Research, 1952), p. 61. For World

We now trace the behavior of the labor force in the setting of approximately full employment that has prevailed in most of recent years.

By the end of 1946, the labor forces of the United States, Great Britain, and Canada had lost their wartime additions and were close to normal; that is, to their proportions of working-age population in previous episodes of peacetime abundance of jobs.

During the subsequent four years, until the Korean outbreak, the over-all proportion remained highly stable in each of the three nations, its maximum range of variation having been 1.5 per cent of population fourteen and older—half to a third of what normally occurs in this country and Canada from one season to another within the same year.

In Canada each sex also held to stable participation rates. But in the United States and Britain this over-all stability was the result of offsetting movements in internal composition as males continued their long-term tendencies to drift out of the labor market with earlier retirement of men above forty-five, or prolonged schooling of boys and young men, and women above twenty-five, chiefly wives, held to their long-run propensities to swap unappreciated housework for remunerated office work. However, these changes corresponded in no consistent way to the variations in armed forces, unemployment, hourly earnings, or disposable incomes, money or real.<sup>6</sup>

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War I and the early stages of World War II, see *The Labor Force in Wartime America, Occasional Paper 14* (N.B.E.R., 1944). This close tie between United States labor force and armed force movements is supported among the quarterly data during 1940-46 by correlations which were  $\gamma_{12} = +.96$  for simple correlation and  $\gamma_{12.34} = +.86$  for partial correlation (holding income and unemployment constant). According to the partial regressions, a rise or fall in the armed forces of 100 persons unaccompanied by any change of income or unemployment would be associated with rise or fall in labor force of 59 persons. This is reasonably close to the overage of 70 for the war gotten from annual data and without holding the other factors constant.

\* Personal disposable incomes include wages and salaries, interest and dividends, rents (including those implicit on owner-occupied dwellings), and pay and allowances to the military; they exclude business savings and payments to government, both personal income tax and non tax. They are data of the Department of Commerce (*Survey of Current Business*, February, 1952, *National Income Supplement*, 1951, p. 209) adjusted by that agency for living-cost changes and by me for seasonal variation. The adult-male-equivalent employed were converted from employment data by broad age-sex groups on the basis of the ratio of factory earnings of young people and women to those of adult males. The purpose of this latter adjustment is to prevent changes in the age-sex composition of labor force from producing a spurious association with income.

The hourly earnings data used here cover the bulk of employed workers, including those in manufacturing, mining, construction, trade, amusement, agriculture, and government. They differ from incomes in excluding dividends, interest, and other nonwage incomes and in not deducting income tax and social security contributions. Since they are payments only for time worked, they are impervious (statistically) to variations in full- and part-time idleness.

In Canada, earnings covered fewer industries, information being not forthcoming for government or agriculture, but their course was very close to that in the United States.

In neither country, incidentally, did hourly earnings behave differently when weighted for given year, for years other than 1940, classified according to industrial composition of employment.

TABLE 1  
CORRELATIONS BETWEEN LABOR FORCE AND ARMED FORCES UNEMPLOYED AND  
DISPOSABLE INCOMES OR HOURLY EARNINGS\*

(Quarterly data, † adjusted where necessary for seasonal variation United States,  
1940-52‡)

		War Period 1940-46	Postwar 1946-52
Simple correlations:			
Labor force and armed forces	$r_{12}$	.956	.589
Labor force and unemployed	$r_{13}$	-.861	Insig.
Labor force and disposable personal income per adult male worker§			
Real income	$r_{14}$	Insig.	Insig.
Money income	$r_{15}$	Insig.	Insig.
Labor force and hourly earnings§			
Real hourly earnings	$r_{16}$	Insig.	Insig.
Money hourly earnings	$r_{17}$	Insig.	Insig.
Multiple correlations:§			
Labor force, armed forces and unemployed	$R_{1,23}$	.956	.601
Adding real income	$R_{1,234}$	.973	.689
Substituting money income	$R_{1,235}$	.963	.633
Substituting real hourly earnings	$R_{1,236}$	.962	.623
Substituting money hourly earnings	$R_{1,237}$	.980	.789
Simple intercorrelations between independent variables§			
Unemployed and			
Armed forces	$r_{22}$	-.885	-.503
Real disposable income	$r_{24}$	-.707	Insig.
Money disposable income	$r_{25}$	-.471	-.447
Real hourly earnings	$r_{26}$	-.507	Insig.
Money hourly earnings	$r_{27}$	.606	-.652
Armed forces and			
Real disposable income	$r_{34}$	.539	Insig.
Money disposable income	$r_{35}$	Insig.	Insig.
Real hourly earnings	$r_{36}$	.504	Insig.
Money hourly earnings	$r_{37}$	-.590	Insig.

\* For sources and explanation of income and hourly earnings data see footnote #6, for sources of labor force, armed forces and unemployment data, see my *Labor Force in War and Transition: Four Countries, Occasional Paper 36* (National Bureau of Economic Research, 1952). The following is the notation: labor force  $X_1$ ; armed forces  $X_2$ ; unemployed  $X_3$ ; real disposable income  $X_4$ ; money disposable income  $X_5$ ; real hourly earnings  $X_6$ ; money hourly earnings  $X_7$ .

† Quarterly averages of monthly estimates in the case of labor force, armed forces, and unemployed; quarterly averages of monthly averages in the case of hourly earnings; quarterly totals in the case of disposable income per adult-male-equivalent employed worker.

‡ First quarter 1940 to second quarter 1946; third quarter 1946 to second quarter 1952.

§ Income and earnings adjusted for linear arithmetic trend.

In the eighteen months after the Korean outbreak, the military strength of the United States and Canada more than doubled and unemployment fell to below pre-recession rates. In contrast to the World War II experience, Canada had no labor force increase. The United States had a rise that was considerably less—even relatively speaking—than in the previous all-out conflict. In the first half of 1952, with

the leveling off of unemployment and military inductions, this rise turned into a small decline.

*The Joint and Several Effects of Armed Forces,  
Unemployment, Income, and Earnings*

When several forces are involved in any behavior, the impact of each may be so obscured by the action of the others that it can be revealed only by examining all the forces in various combinations—by multiple correlations.

The multiple relationships are tested here for two periods: what we call the war period, the twenty-six quarters from 1940 through mid-1946, and what we call the postwar period, the twenty-four quarters during mid-1946-52 (Table 1). Labor force and unemployment are corrected for seasonal variation and, together with armed forces, are expressed in number per thousand population fourteen and older, thus eliminating any trend introduced purely by time. Income is given in quarterly totals and hourly earnings in quarterly averages. Each is separately correlated in real terms and also in deviations from the upward linear arithmetic trend, on the theory that workers may get accustomed to a certain rate of income advance and alter their labor force tendencies only when wages move up especially rapidly or slowly.

During World War II the labor force manifested a very high simple relationship with armed forces (.96)—one so high in fact that addition of both unemployment and income or earnings yielded multiple correlations only one or two points higher. Does this mean that size of armed forces was the only significant determinant of the labor force during that great conflict? Such conclusions should be drawn only with great care. Interpretation of correlations becomes necessarily complicated whenever the so-called "independent variables" are not independent of each other. In this case the labor force was also rather highly correlated with unemployment ( $-.86$ ) which was in turn correlated to about the same degree with armed forces. Which of these variables may we infer to have been the prime mover?

Fortunately the solution is simplified, both by the fact that the correlation between the labor force and armed forces was the strongest of the various relationships, and by the reflection that it would be unimaginable for labor force or the unemployed to have determined the size of armed force, for we know that our draft was determined in overwhelming degree by the events of the war. We can, on the other hand, construct a very strong a priori assumption that armed forces could influence the size of both unemployment and the labor force.



An increase could reduce unemployment by drawing idle persons directly into the armed forces and by raising an enormous associated demand for labor in order to arm and equip our fighting forces. It could expand the labor force, not only by drawing millions of young men from schools into the armed forces and therefore into the labor force, but also, as I have shown in my *Occasional Paper*, by reducing the number of persons in private families that women must cook and make beds for, and thus releasing females from housework to the labor market. If armed forces simultaneously determine both unemployment and labor force, we have a satisfactory explanation for the three-cornered correlation. We may be justified in concluding that unemployment was not a truly independent variable and contributed little additional explanation of labor force behavior. This conclusion is further supported by the lack of significant correlation between labor force and either income or unemployment in the postwar period. The postwar correlation, incidentally, that becomes weaker in all respects when the labor force was assumed to lag one year behind the independent variables. It must be admitted, of course, that even armed forces manifested a distinctly weaker association with labor force in the years between 1946 and 1952. This difference from the strong wartime association has two possible explanations. One is that powerful patriotic and other moral forces reinforce the impact of all-out mobilization on labor supply. The other is that the underlying estimates of labor force—furnished by the census—are exposed to sampling errors that are minor in relation to the huge wartime variations but play a more prominent role in the moderate postwar changes. The census gives sampling variabilities by size of estimate. From these it may be calculated that there is a 95 per cent chance that the error for an over-all labor force of around 60 million persons would be 650,000 in any one month (*Current Population Reports*, Series P-57, No. 118, page 12). Assuming that errors in successive months would be independent of each other, the possibility of such an error continuing for three months and thus appearing as a quarterly deviation is, of course, much less. If  $X_1 = 2\sigma = 650,000$ , then  $(X_1, X_2, X_3) = 650,000 = 375,000$  persons, or roughly  $\pm 3$  per

$$\sqrt{3}$$

1,000 population fourteen and older. Such a sampling error is very small compared to an average labor force of about 550 per 1,000 population fourteen and older, but is appreciable in comparison with quarter-to-quarter deviations in the peacetime labor force of 16 or less per 1,000 population fourteen and older. Similarly computed, the sampling error for the census unemployment estimate would be about  $\pm 1$  per 1,000 population fourteen and older. The error is large compared to both average

level of, and variation in, postwar unemployment, which ranged from 7 to 21 per 1,000 population fourteen and older. These percentages do not include the virtually unmeasurable errors of biased response or faulty sample stratification. (See my comments in "Statistical Standards and the Census," *American Statistician*, February, 1952.) In the case of Canada, every influence on labor force since 1946 turns out to be without import, including that of armed forces; again a lag of one year behind armed forces, unemployed and real income yielded still weaker correlations.

Does the lack of response to income or earnings, either below or above full employment, refute Keynes's supposed observation that labor refuses to work if money wages fall? It is important here to know just what Keynes had in mind. His idea of the reaction of labor was that it was static or instantaneous; nevertheless, the fact that he advanced it from "observation" surely exposes it to test by behavior over time. He ignored effects of nonlabor incomes of labor; whereas this study uses all incomes. Keynes was really suggesting that aggregate labor will tend to withdraw its services through strike at any decline in money wages; yet even the most casual examination will reveal that no mass tendency ordinarily follows such reduction: the most notable general strike in recent history occurred in Great Britain in the mid-twenties and was a fiasco.<sup>7</sup> Except for this general variety, a strike is a withdrawal of labor from a particular employer and not necessarily from the whole market. Indeed the only time I can get a man to come out and wash my windows or cut my lawn is when the furnaces are cold at the great Bethlehem Steel plant in Baltimore. This consideration provides the exegesis for Keynes's postulate. He obtained a perfectly sensitive labor supply by confusing it with employment and neglecting the availability of the unemployed. Our data, which include both workers and work-seekers, have a reasonably valid claim to be measuring labor supply insofar, at least, as the labor force dimension is concerned.

<sup>7</sup> Although examination of man-hours lost through strikes in the United States since 1927 indicates some tendency of strikes to rise when money wages, measured by hourly earnings in manufacturing, decline or stop rising, such strike waves are much too small to be regarded as furnishing empirical support for the type of short-run elastic labor supply function postulated by Keynes; and the biggest strike wave seems to have been occasioned not by great decline of money wages, as in the early thirties, but by the rise in the cost of living, as in 1946. Contrast this with Keynes's statement: "It is sometimes said that it would be illogical for labor to resist a reduction of money wages but not to resist a reduction of real wages. . . . This might not be so illogical as it appears at first; and as we shall see later, fortunately so. But whether logical or illogical, experience shows that this is how labour in part behaves." (*Op. cit.*, p. 9.) For the United States strike record as recorded by the Bureau of Labor Statistics, see *Historical Statistics of the United States, Statistical Abstract of the United States*, 1951; see, also, A. M. Ross and Donald Irwin, "Strike Experience in Five Countries," *Industrial and Labour Relations Review*, April, 1951.

*Other Aspects of Labor Supply*

What about the impact of high effective demand on other labor supply dimensions? My own unpublished researches indicate that long-run declines in the full-time work week are pretty much suspended during years when there is enough work to go around and that the quality of the labor force, measured by weighting women and children according to the ratios of their earnings to those of adult males, changes little even in years of not inconsiderable shift in labor force composition. Future research will, I think, disclose that population migration rates, employment quit rates, and strike rates, while much higher than in years of depression, do not, once high employment is achieved, manifest subsequent trends suggesting either a strengthening or a weakening in labor effectiveness.

As for labor effort, this strategic dimension is hard to separate from the myriad other factors underlying man-hour productivity, such as capital investment and management effort. Some of my studies suggest a decline in individual worker efficiency rates in time of high employment. But labor effort in the aggregate does not deteriorate so much as to prevent significant advances in output per man-hour. The recent productivity study of F. C. Mills discloses that the advance in the man-hour output during the high-employment decade of 1941-50, while not impressive, may have been equal to that of any other decade except the high-employment years 1921-30 which contributed the greatest relative increase in man-hour output of this half century (*Productivity and Economic Progress, Occasional Paper 38*, National Bureau of Economic Research, page 2).

*Summary and Conclusions*

The results of this paper lead to the following conclusions:

1. There may be significant differences between depression and full employment in the behavior of nonlabor force dimensions of labor supply: full-time hours, labor turnover, labor migration, strike rates, and intensity of effort. But evidence has yet to be forthcoming that these are enormous or grow greatly under prolonged full employment.
2. The labor force itself behaves in no fundamentally different way at or above full employment from what it does below. It declines, but only slightly, when job opportunities are extremely scarce. At all times it appears insensitive to moderate variations in unemployment or in real or money incomes or hourly earnings. Its wartime response to armed forces can pretty clearly be traced to the direct effect of mobilization on school attendance and need for women in housework rather than on the effective demand for labor (*The Labor Force in War and Transition: Four Countries, op. cit.*, pages 29-32).

3. So far as concerns the labor force in short periods and times of approximately full employment, these results support none of the hypotheses advanced earlier. For a given size of armed forces the labor force is a highly stable proportion of the population. This stability has applied not only to net changes in the labor force but also to gross changes, measured by the number of workers who enter and leave each month. Such turnover varies widely from season to season and differs widely between males and females but does not appear to be influenced by unemployment. Since 1948, when such data began to be gathered, labor force turnover continued to have the same path and range despite the fluctuation of unemployment between 3 and 7 per cent. The labor force gains no net reinforcement under pressure of high effective demand (except under extensive military mobilization) and loses no net number of workers under influence of high incomes. High-income-induced withdrawals almost certainly occur under static conditions but appear to be offset over time by some dynamic element. What that element is, why it should contribute such stability, and whether it may continue in the future are subjects too involved for this paper but will be dealt with in a final report.

## DISCUSSION

RICHARD A. LESTER: In seeking to analyze wage levels under full employment, there is need to sharpen the issues, to develop hypotheses, and to test them by experience. Professor Rees gives us something to shoot at and I shall take advantage of the opportunities he seems to offer. In doing so, I should say that with much of his paper I do agree.

In my opinion, however, he fails to put sufficient stress on certain institutional factors affecting employment, and his assumptions with respect to the processes by which wage increases occur in this country under full employment appear to be open to question.

Part of Professor Rees's analysis runs in terms of labor demand and supply and whether they are evenly balanced at existing wage rates. He even refers to Abba Lerner's proposal to achieve some such balancing, though dismissing it as rather impractical. Not only is it impractical, the proposal itself reveals a remarkable unawareness of the nature of hiring and employment practices in modern industry, such as hiring at the bottom of the occupational ladder, promotion from within the plant, seniority in lay-off and opportunity for promotion, and benefits according to length of continuous service with the firm.

Given such an institutional setup and with widespread unionization and collective bargaining, the process by which the level of wages of large firms or industries or the country as a whole moves upward is not likely to be controlled largely by labor mobility or the development of labor shortages. Certain key bargains are likely to set the pace, especially in industries enjoying rather inelastic demand because, say, of insistent munitions requirements. In short, some of the key bargains in recent years have been those in coal, steel, electrical equipment, automobiles, railroads, and building.

Adequate statistical support seems to be lacking for Professor Rees's conclusions that (1) "with the notable exception of the United Mine Workers, American unions have failed to keep pace with the inflation while seeking wage gains vigorously" and (2) "since 1939 most of the nonunionized sector has had relative wage increases equal to or exceeding those of the unionized sector."

In the first quotation, perhaps the word inflation begs the issue. Certainly in the key industries mentioned, the increases in straight-time hourly earnings or even wage scales have more than compensated for increases in the cost of living in recent years.

Whether in recent years wage gains have been greater in nonunion than in the unionized sectors of American industry is somewhat difficult to determine, especially if one allows for the fact that for the past century unskilled rates have been rising relative to skilled rates (wage structures have been compressed here and abroad) and that scales in low-wage industries have generally been rising by smaller absolute amounts but by larger percentages than in high-wage industries.<sup>1</sup>

<sup>1</sup>For a discussion of this phenomenon, see A. M. Ross, "The Influence of Unionism upon Earnings," *Quarterly Journal of Economics*, February, 1948, pp. 267-271.



Despite such influences, the following table indicates that the highly unionized industries since 1939, and especially since 1945, seem to have enjoyed larger percentage increases in hourly wages than have industries that are poorly organized or practically unorganized. (Note that the figures in the table do not include the recent increase of \$1.90 a day in coal.)

AVERAGE HOURLY EARNINGS

Unionized Industries	1939	September 1952 as % of 1939	September 1952 as % of 1945
1. Building construction	\$ .932	252.1	170.4
2. Bituminous coal	.886	255.6	182.6
3. Metal mining	.708	269.2	182.9
4. Railroads (Class I)	.956	249.9	190.8
5. Steel (blast furnaces, steel works and rolling mills)	.845	252.7	179.7
6. Electrical machinery	.702	245.6	163.7
Simple average	\$ .838	254.2	178.4
Industries Largely Unorganized			
1. Wholesale trade	\$ .715	235.9	163.9
2. Retail trade (general merchandise stores)	.454	231.7	165.7
3. Retail trade (auto and accessories dealers)	.571	275.1	164.5
4. Hotels	.324	268.8	158.4
5. Laundries	.417	229.0	144.7
6. Cleaning and dyeing	.490	227.6	144.8
Simple average	\$ .482	245.0	157.0

SOURCE: U. S. Bureau of Labor Statistics.

Table based on preliminary figures slightly altered in subsequent revision.

In the light of such statistics and of interview material on wage level increases, it would seem as though the larger unions have played a more significant leadership role in wage increases than Professor Rees contends, and that the economic forces of interfirm movement of labor and the development of labor shortages have not been such influential factors in the amount of wage level change as his remarks would seem to imply.

Monetary-fiscal policy can avoid continued wage and price control, but, when our economy is confronted by a sharp upswing in military expenditures and farm prices, a temporary wage freeze and a brief period of controls may be desirable to avoid upsets in traditional wage relationships, especially between industries, that could have "ratchet" effects. I hasten to add that last February before the Joint Committee on the Economic Report, I recommended that preparations be made to abandon all wage controls by the past summer or, at the latest, by the end of 1952.

Professor Long's paper summarizes his conclusions from statistical investigations of labor force and income level relationships—a subject that he has cultivated intensively for some time. Consequently, his paper contains no surprises.

In addition to such a study of past statistical relationships (if any), it would seem worth while to analyze more in detail the characteristics of our labor force: its adaptability, its mobility, and the degrees of employability of its components. How are institutional practices, like seniority, hiring at the bottom, and in-plant promotion, affecting interplant mobility? Given current selection and hiring policies of firms, what personal characteristics reduce worker employability? What relationships exist between voluntary turnover of labor and the degree of unemployment? How are labor supply and mobility affected by current old age and unemployment insurance programs.

I, for one, hope that Professor Long will probe further the institutional and qualitative aspects of his subject, for it is becoming increasingly clear that marked differences exist between the labor force concept and concepts of labor supply.

CHARLES A. MYERS: Professor Rees's analysis of union pressure on wage levels under conditions of long-run full employment offers an intriguing and partially convincing alternative to the Wagnerian predictions of doom which Lindblom's *Unions and Capitalism* gave us. But, like Lindblom, he may claim too much for his hypothesis. Surely the contention that collective bargaining in this country tends to retard wage increases when strong inflationary pressures are present needs verification in more industries than steel and coal (and even here we have probably not had the final word). Furthermore, the corresponding rise in wages in the nonunion sector since 1939 is not conclusive, for the pulling power of union wage increases and the impact of World War II wage stabilization policies in tending to equalize wage changes throughout industry should be given some weight.

The Swedish experience, as Rees points out, needs to be studied by American economists interested in wage policy. The "wage slide" of about 4 per cent a year which took place during two years of "wage restraint," because of employer efforts to retain and attract scarce labor, is a reflection of inflationary pressures on wages apparently independent of unions. But in 1951, the Swedish Federation of Labor (L.O.) negotiated an average general increase of 15 to 18 per cent and another 11 to 13 per cent in 1952. The Social Democratic (labor) government was apparently enough concerned about the possible independent effect of wage settlements on the price level to hold a series of conferences with union leaders and organized employer representatives during these negotiations.

An L.O. press release in September, 1952, commenting on the 1952 increase, added: "The upward movements in the level of prices have, so far, this year amounted to about 4 per cent, chiefly caused by higher wages." However, it was also claimed that the increase had raised real wages by 6 per cent. In November, 1952, the L.O. reported that its Assembly of Representatives had decided to advise constituent unions against seeking any general rise in wages in 1953, because of "worsening tendencies in the Swedish labour market during the past year."<sup>1</sup>

<sup>1</sup> *Information to Foreign Countries* (Swedish Confederation of Trade Unions, Publicity Department), Series III, No. 11, November, 1952.

When Sweden's highly centralized wage bargaining failed to bring moderate wage increases in the face of inflationary pressures in 1951 and 1952, it is certainly less likely that the rival unionism and separate bargaining characteristic of the American labor movement will be able to do so. Rees's prescription, therefore, deserves thoughtful consideration by American unions. Price stability can be maintained under the Beveridge definition of full employment only with the aid of price and wage controls, as during World War II and in the more recent post-Korea period. The alternative is enough unemployment to moderate the pressure on wages and prices, and this is the price that unions may have to pay to avoid public intervention in the terms of collective bargaining settlements.

The 1949-50 recession was a clear demonstration that wage settlements in this country are sensitive to the level of employment, since there was no general "round" in this period. But Rees does not suggest this much unemployment, nor is it likely that any government could have avoided fiscal and monetary policies to reduce it if the recession had lasted longer. "Appropriate fiscal and monetary policy," to use Rees's term, is probably easier to talk about than to define or to pursue. It has not been demonstrated that unions (or employers) which suffer from the implementation of these policies in order to make "wage behavior consistent with price stability" will desist from bringing successful pressure on government to relax these policies. The effort of the U.A.W. and the auto manufacturers to get installment restrictions on automobile purchases relaxed when sales and employment dropped is a case in point.

The more realistic alternative is probably at best a gradual rise in the price level during the conditions of full employment which are politically necessary. In this situation, it is difficult not to believe, despite Rees's argument, that strong and strategically located unions will be able to protect the real incomes of their members better than nonunion workers protect theirs through the competition of employers for their labor.

As an illustration, the average gross hourly earnings in all manufacturing industries rose 15 per cent between the outbreak of the Korean war in June, 1950, and August, 1952 (the latest month for which data are available at this time). During the same period, the BLS Consumers' Price Index rose approximately 12 per cent, and the unweighted average gross hourly earnings in ten strongly unionized mining and manufacturing industries rose nearly 18 per cent.<sup>2</sup> This occurred during a period when wage and price controls were partially effective, and we scarcely need to be reminded that the attempts of powerful unions to stretch wage stabilization regulations have been a major

<sup>2</sup> Computed from data reported in the *Monthly Labor Review*, December, 1950, and November, 1952. The ten selected industries were: bituminous coal; meatpacking; petroleum refining; tires and inner tubes; blast furnaces, steel works and rolling mills; primary smelting and refining of copper, lead, and zinc; agricultural machinery and tractors; electrical machinery (industry group); automobiles; shipbuilding and repairing. Gross earnings do not appear to be significantly distorted between the two periods by overtime, since the percentage increase in all manufacturing (excluding overtime) was the same as for gross earnings. Furthermore, average weekly hours rose only slightly in three of the selected industries, while falling or remaining the same in the other seven. The earnings increase in bituminous coal, incidentally, did not include the last negotiated increase, and if this industry is excluded, the average for the nine is 18.6 per cent.

problem for the control program. This experience also casts some doubt on Rees's assertion that "with the notable exception of the United Mine Workers, these [American] unions have failed to keep pace with the inflation while seeking wage gains vigorously."

Professor Long examines another facet of full employment: how does the size of the labor force vary with changes in effective demand and by how much? His extensive studies for the National Bureau of Economic Research are the basis for his conclusion that at any given time the size of the labor force varies inversely with real wage and salary earnings of adult male workers but that it is a highly stable proportion of the total population over longer periods. Long's suggestion at the end of his paper that this apparent contradiction is explained by "some dynamic element" leaves his readers awaiting the involved analysis which he promises in a final report. We are thus in the position of the followers of a serial "whodunit" who must wait until next month (or perhaps next year) for the author's detailed explanation of the mystery.

Meanwhile, we need to know more about how groups within the total labor force—older workers, women, young people, marginal workers—who account for its variations over shorter periods, react to changes in levels of money and real incomes and why. Professor Long's studies give us the broad picture of labor force behavior, but local labor market studies or larger research projects such as the six-city study of labor mobility conducted jointly by the Social Science Research Council and research centers in seven universities,<sup>3</sup> are needed to test these hypotheses and give qualitative meaning to aggregative data.

<sup>3</sup> *Survey of Occupational Mobility*, conducted by Co-operating University Research Centers and the Social Science Research Council for the U. S. Department of the Air Force and the U. S. Bureau of the Census, 1952 (mimeographed reports from the co-operating universities).

# THE THEORY OF INCOME DISTRIBUTION

## THE FRUITS OF PROGRESS AND THE DYNAMICS OF DISTRIBUTION

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The classical economists devoted a good deal of attention to the problem of what happened to the various magnitudes of an economic system "in the progress of society," especially the structure of relative prices and the distributional shares. This is what Baumol has felicitously called the "magnificent dynamics." Since the days of Mill, however, economists have been preoccupied with developing equilibrium theory and comparative statics, and even the recent revival of interest in dynamics as a result of the use of difference equations (notably by Samuelson) has been confined to problems "in the small" rather than in the large. Moreover, the demise of the wage-fund theory left the classical dynamics in ruins, and no adequate macroeconomic theory of distribution has ever filled the gap.

The problem of filling this gap is of more than academic interest. One of the main appeals of Marxism is that it has a magnificent dynamics of its own. The weaknesses of the Marxist, as of the classical theory which it in many ways resembles, are apparent both in logic and in practice. Things have simply not turned out in the way that either the classical economists or Marx foretold. Wages do not move to a subsistence level, but the proportion of national income going to labor is almost stationary, or even shows slight increases, in the face of an enormous rise in national income. Profits do not exhibit any significant long-run downward trend, even in the face of enormous accumulations of capital. Rent does not swell to gobble up the fruits of progress, but becomes an increasingly insignificant part of national income. Nevertheless, all the facts in the world do not seem to be adequate to demolish an elegant and appealing theory. Only theory can kill a theory, and the intellectual appeal of Marxism depends in no small degree on the weakness of the alternative theories of long-run change.

One does not hope in half an hour to rebuild from scratch a major area of economic theory. Nevertheless, it may be possible to indicate at least the problems with which a magnificent dynamics must deal.



The main problem is the impact of progress on the structure of economic life. We must ask ourselves, therefore, what are the significant components of structure for this purpose. Suppose we take the short cut of defining technical progress as an increase in per capita real income of a society. There are great index-number difficulties in such a definition, but it is the only definition which seems to offer even a hope of quantitative analysis. Then the problem of long-run dynamics is concerned with the determinants of the changes in the distribution of total income among various significant categories as total income itself increases (or, of course, decreases).

The main focus of this paper is the problem of distribution according to functional shares. Nevertheless, it should be observed briefly that many other distributions of income are relevant to the general problem of the reciprocal relations of structure and growth. Interesting work has been done, for example by Colin Clark, on the effects of economic progress on the distribution of income by industry of origin. Here we have the famous proposition that in the course of economic progress primary industries (e.g., agriculture) undergo a relative decline and that in later stages even secondary industries (manufacturing) may decline relative to the tertiary service trades.

Another very interesting question is the structure of technical change itself and its impact both on general rates of growth and on the structural consequences of growth. The classification of technical improvements into labor-saving, land-saving, and capital-saving is of considerable importance here. From the point of view of growth of income per head, land-saving improvements, permitting a greater product per acre, may be a prerequisite of economic development. One might even make a special category of space-saving improvements, of which land-saving improvements are one part and transportation improvements another part. The main significance of these is, first, the impact of land-saving improvements on nutrition in crowded areas and, secondly, the external economies effect of space-saving improvements which permit greater specialization and more trade. An increase in output of food per acre, for instance, may be of more immediate importance to India than an increase in output per man: one will give immediately better nutrition; the other might merely create more rural underemployment. The capital-saving nature of an improvement is also of importance for the low-level areas, which need improvements which increase output per man and per acre without involving much accumulation of capital—hoes and land reorganization rather than dams and tractors.

With this brief glance at the wider aspects we can now return to the "classical distribution" problem, or distribution by functional

shares. Cannan distinguished what he called "pseudo distribution," which is the problem of what determines wages per head, rent per acre, and interest per cent from the "true" distribution problem which is that of what determines the number of people in various size-of-income categories, or personal distribution. There is also another related problem, which is that of the determinants of the functional distributional shares; that is, the proportion of income going to labor, to land, and to capital or to any other interesting category of functional income. The link between all three aspects of distribution is the distribution of wealth—that is, of various kinds of assets—among different holders or groups of holders. We suppose that income accrues to any individual as a result of the productive employment of assets which he owns. We include, of course, minds and bodies among assets; so that labor income is seen to be just as much derived from the employment of an asset as any other form of income. Then the income of any individual is the sum of the incomes which he receives from his various assets, and each of these is equal to the quantity of the asset owned, multiplied by the income per unit of asset. Given, therefore, the income per unit of asset and given the personal distribution of assets, it is a mere matter of arithmetic to calculate both the personal distribution of income by size groups and the proportion of income going to any particular asset factor. It would seem, therefore, as if the distribution problem were a mere matter of price theory, coupled perhaps with some notes on the dynamics of inheritance and the distribution of property. It is well known, for instance, that property tends to concentrate into the hands of elderly maiden ladies, that primogeniture and a caste system concentrate it, while equal division among children and class mobility tend to disperse it.

If the dynamics of property distribution can thus summarily be disposed of or perhaps handed over to the sociologists, it would look as if pseudo distribution in Cannan's sense is the heart of the problem. It is not, however, as it might appear, a simple problem in price theory. In effect that is the assumption of the marginal productivity theory as applied to this problem. The reward of each factor tends to be equal to its marginal productivity, which declines with increase in the quantity of the factor: the more we have of any factor, therefore, the less will be its remuneration per unit, following the declining line of the marginal productivity curve. This assumes, of course, that each factor is fully employed, or at least that the amount employed is limited only by voluntary withdrawals into "leisure" uses.

A fallacy of composition is involved here, however, analogous to that involved in the view that a reduction of wages is all that is necessary to secure full employment. We are facing a system of gen-

eral price determination, and it cannot be assumed, as in partial analysis, that the demand functions for factors are invariant with respect to their prices. Even the general conclusions of the marginal productivity analysis need to be questioned: for instance, that if population is high relative to capital and land, wages will be low, or that if land is plentiful relative to population and capital, rents will be low.

What is needed to replace the classical theory is a macroeconomic theory of distribution. In this regard I find myself in a somewhat delicate position, having an axe to grind of my own. In my *Reconstruction of Economics* I put forward what purported to be a macroeconomic theory of distribution—or at least a stab in that direction. This theory has been received with catcalls and abuse from both sides of the Atlantic, as well as by some intelligent criticism. This is hardly the place either to state it or to defend or even to modify it. Nevertheless, as it occupies a predominant place in my own thinking and as I still believe it to be substantially correct in spite of many infelicities in its original expression and some rather legitimate misunderstandings on the part of the critics, I can hardly throw it altogether to one side. For the remainder of this paper, therefore, I propose to consider briefly what a macroeconomic model is and along what lines macroeconomic models of distribution might be constructed.

Any macroeconomic model consists, first, of two parts: one or more identities relating various aggregates of the system and sufficient behavior equations relating the aggregates of the identities among themselves to give an equal number of equations and unknowns and so make an equilibrium solution possible. The behavior equations may include variables not in the basic identities, as long as there are enough equations to determine all the unknowns. A behavior equation may be defined as a relationship among aggregates corresponding to some aspect of human behavior such that, if the relationship is not satisfied by the variables of the system, behavior will take place in the direction of changing some of the variables involved. The validity of any model—i.e., its usefulness in interpreting the phenomena of economic life—depends on two factors: The first is whether the aggregates which are the basic variables of the models are homogeneous enough so that changes in the composition and structure of the aggregate can be neglected. This condition can never be fulfilled perfectly, but if the aggregates are grossly heterogeneous, changes in their structure will affect the stability of the behavior equations. The second factor is whether the behavior equations do in fact correspond to stable patterns of human behavior. If the dynamics of the model are to be meaningful, the behavior equations must be capable of expression as stable difference equations, relating the values of one set of variables

(the response variables) as determined by the values of another set (the stimulus variables) in a previous period or periods.

A model can fall short of these ideal requirements to a considerable degree and still be useful. A good example is the basic model of the Keynesian system (which I have sometimes called the sub-Keynesian system). This consists of an identity: Production or income ( $Y$ ) = Consumption ( $C$ ) plus Accumulation ( $A$ ), and two behavior equations, a consumption function  $C = F_c(Y)$  and an investment or accumulation function  $I = F_i(Y)$ . The aggregates involved are extremely heterogeneous. Consumption, for instance, depends not only on the size of output (income) but also on its composition and distribution, in both space and time. The consumption function also is not very stable in time—a truth which was brought sadly home to the attention of economists by the debacle of the postwar unemployment predictions. Nevertheless, this model, crude and imperfect as it is, has proved to be the key which has unlocked the basic mysteries of the phenomenon of unemployment.

Consider, then, what we are looking for in a basic model of distribution theory. Let us take the simplest possible distribution of national income by functional shares: that into wages ( $W$ ) and not-wages ( $V$ ). Not-wages then includes profit, rent, and interest. By the principle that the whole national product is divided we have a basic identity.

$$Y = W + V \quad (1)$$

We can now postulate slightly more extended consumption and investment functions,

$$C = F_c(W, V) \quad (2)$$

$$I = F_i(W, V) \quad (3)$$

and we still have the basic composition-of-product, or "savings-investment" identity,

$$Y = C + I \quad (4)$$

This system is incomplete, however: it has four equations but five unknowns, so that it needs another equation to make it an equilibrium system. The question is, what equation should we postulate? The classical economists in effect postulated an equation  $W = kS$ , where  $S$  is the total stock of capital. This is the wage fund theory that the total wage bill is a certain proportion of the total stock of capital—a proportion determined by the tastes and habits of the capitalist. In a short period,  $S$  can be taken as given; so that the equation does not introduce an additional unknown. It does not, however, represent an acceptable behavior equation, as it is difficult to visualize any specific behavior which will result if it is not fulfilled.

The marginal productivity theory in effect postulates the equation  $W = F_w(L)$  where  $L$  is the total labor force and is assumed given, for the theory that assumes that the average wage is equal to some "average" marginal productivity of labor, which in turn is supposed to be a function of the labor force. What this assumes in terms of behavior is that if there is unemployment, the average real wage will fall and that as it falls employment will rise; corresponding to full employment, there is a unique real wage per head and therefore a unique total wage bill. The difficulty with this behavior assumption is not only that it is unrealistic in modern society to assume that unemployment will produce much pressure even on money wages but that it is doubtful whether a decline in money wages will result in a decline in real wages, because a general decline in money wages will set off a fall in commodity prices and so may not lead to decline in real wages.

In my *Reconstruction of Economics*, I suggested another approach to the "missing equation," this time in terms of the aggregate balance sheet identity—one of the necessary relationships of the system which has been surprisingly neglected in economic model-building. Aggregate business savings are defined as the increase in net worths of all businesses. This must be equal to the increase in net business assets, which is composed of four other quantities: the increase in the value of real assets held by businesses ("Investment"),  $I$ ; the increase in the money stock of businesses,  $dM_b$ , the increase in the debts of households to businesses (consumers credit, for the most part)  $dK_b$ , less the increase in debts of businesses to households (securities of businesses held by households)  $dK'_b$ . Total not-wages ( $V$ ) now are equal to business savings plus business distributions in interest and dividends ( $D$ ), so that we have

$$V = I + dM_b + dK_b - dK'_b + D \quad (5)$$

Mr. Turvey, in his excellent review of the *Reconstruction (Economica*, May, 1951, page 203), pointed out, in effect, that  $I$  and  $dK'_b$  were not independent as, if investment is financed by the sale of securities to households  $I$  is exactly offset by the increase in securities in the hands of households, so that  $I - dK'_b = 0$ . This defect in the formulation, however, can easily be taken care of if we write  $I - dK'_b = I_n$ ,  $I_n$  then being internally financed investment; that is, investment financed out of profits. Identity (5) then becomes

$$V = I_n + D + dM_b + dK_b \quad (6)$$

This same identity can easily be put into a "wages" form if we write

$$\begin{aligned} W &= Y - V = C + I - I_n - (dM_b + D + dK_b) \\ &= C + I_e - (dM_b + D + dK_b) \end{aligned} \quad (7)$$



where  $I_e$  is externally financed investment; i.e., investment financed by the issuance of securities to the public. Identities (6) and (7) are of course merely different forms of the same basic identity; they do not represent two independent equations.

We have now added a missing equation to our total system, but in so doing we have added five more unknowns —  $I_e$ ,  $I_n$ ,  $dM_b$ ,  $D$ , and  $dK_b$ —and need five more equations! One of these is an identity,

$$I = I_e + I_n \quad (8)$$

which leaves us with the necessity of finding four more behavior equations, governing the variables  $I_e$  (or  $I_n$ ),  $dM_b$ ,  $D$ , and  $dK_b$ . Each of these variables, however, corresponds to a specific area of decision. Their magnitude can be regarded as determined by the sum of other magnitudes, each of which is determined as a result of individual decision. Thus the total of both internally and externally financed investment is a result of decisions taken by individual businessmen. We can treat them simply as exogenous variables in the model or they can be regarded as functions of some of the other variables of the system. The increase in the money stocks of businesses is a reflection of two factors: first, the relative liquidity preferences of businesses and households (a higher relative liquidity preference of businesses drawing money out of household into business balances), and second, the change in the total money stock. Again this can be assumed to be an exogenous variable without too much injustice to truth, especially as the longer the period we take the smaller this item will be relative to the others. Thus in a short period an increase in dividends may result in a shift of the money stock from business into household balances which will in part offset the increase in dividends, but over longer periods this effect will be unimportant. The consumers credit item may likewise be regarded as exogenous, or may be related in a consumers credit function to other variables such as  $W$  or  $Y$ .

It is not the purpose of this paper to examine in detail the properties of this model, especially as I have discussed the properties of a similar model in *The Impact of the Union* (Harcourt, Brace, 1951). What is relevant for the present purpose is the light which the model throws on the cumulative processes of society. There are three principal cumulative processes: the growth of population, of capital, and of knowledge. The growth of population increases consumption but it also increases investment; so that it is not easy to forecast the effect on the relative composition of national income into the two components. The growth of capital on the other hand may be expected to shift the composition of national income away from investment towards consumption, for as capital grows the opportunities for increasing capital usefully must eventually decline, while consumption, at least in the form

of maintenance and depreciation, will increase. The growth of knowledge may postpone this process by opening up new fields for investment.

What, then, are likely to be the effects of these changes on distribution? In the long run, it is clear that we can neglect the items  $dM_b$  and  $dK_b$ . Businesses can neither accumulate money nor expand consumers credit for ever, unless there is a perpetual inflation. A general shift from investment into consumption as components of national income, reflected in a rise in the consumption function and a fall in the investment function, is likely to have a broad effect in increasing wages at the expense of not-wages. This effect may be offset in part if there is at the same time a shift in the structure of investment itself from externally financed to internally financed investment.

By far the most important conclusion which can be drawn from the model, however, is that the ultimate long-run tendency depends on the nature of the "dividends function." If firms on the whole distribute a constant proportion of their total earnings, these earnings will eventually shrink to zero, for in the final equilibrium,  $I_n = dM_b = dK_b = 0$ , so that  $V = D$ . The existence of contractual distributions in interest and rent will prevent the disappearance of not-wages altogether, but unless there is some level of profits at which total business distributions equal profits with positive dividends (i.e., a level at which there is no attempted net business saving), dividends will disappear.

Thus while it is perfectly possible to make assumptions about the behavior functions in the model which will give us a "day of judgment" on Keynesian or Marxist lines, in which accumulation is so great that all investment ceases, in which profits fall to zero and in which consumption is not adequate to absorb the full employment output, so that the system perishes in a slough of unemployment and profitlessness, such a conclusion is not necessary but depends on certain behavior functions which are themselves subject to public influence. It may be that even without public intervention the behavior functions will permit full employment and a sufficient distribution of national income to profits to permit the operation of a private enterprise system in, or as we approach, the stationary state. What emerges in any case from the analysis is a concept of long-run dynamics which is much less deterministic than that of the classical, the Marxist, or the marginal school. The historical movement of the relative shares is determined by how people behave or are induced to behave and is not predetermined by any iron physical laws.

The problem of the mutual relationship of the structure of technical change and the structure of distribution of income is another fascinating field of study to which very little attention has been given and

in regard to which only a few brief suggestions can be offered here. The personal distribution of income will clearly affect the direction of technical change. Thus the technical skill which in ancient Egypt all went into the construction of mighty pyramids for the pharaoh, in more equalitarian societies goes into the development of conveniences and luxuries for the masses. It is perhaps less obvious but equally true that the nature of techniques and the direction of technical change will affect the personal distribution of income. An improvement in food supplies can hardly help being fairly evenly distributed—the capacity even of the richest stomach being limited. Automobiles, likewise, if there are enough of them, can hardly help being fairly equally distributed. The improvements in tailoring brought good clothes to nearly everybody. On the other hand, improvements in the production of extreme luxuries cannot possibly be diffused among the people. There seems to be here a wide field both for theoretical and historical inquiry.

Another problem of great practical importance, but one in which our ignorance is virtually complete, is that of the effects of redistribution of income and wealth on the rate of economic development itself. The importance of this problem rests on a matter of simple arithmetic: that if redistribution towards any group causes a fall in the rate of growth of national income, no matter how slight, there will be some date beyond which the absolute income of the favored group will be less than what it would have been if the redistribution had not taken place. Thus in the Figure 1 we suppose that national income (in real terms) is  $OB$  at the base date and that this is divided into two parts,  $OA$  and  $AB$ . What the two parts are is immaterial. They can be wages and profits, or agriculture and industry, or rich and poor, or any dichotomy we please. National income grows, we suppose, at a constant rate following the line  $Bb$  on the log scale. The absolute value of the  $A$ -share follows the parallel line  $Aa$ , if the proportionate shares are constant. Now suppose that an initial increase in the  $A$ -share from  $OA$  to  $OA'$ , the proportion to national income being again held constant, results in a decline in the rate of growth. National income follows the line  $Bb'$ , and the absolute value of the  $A$ -share follows the line  $A'a'$ . It is clear that  $Aa$  and  $A'a'$  must intersect. If  $E$  is the point of intersection, then at the corresponding date  $F$  the absolute income of the  $A$ -group will be just equal to what it would have been had there been no redistribution in its favor. Beyond  $F$ , of course, the absolute income of the  $A$ -group is less than it would have been had it not been "favored," and the disparity continually increases. If there is not time discounting, it is clear that it will never pay any group to accept a redistribution in its favor which lowers the rate of growth even by the smallest amount, even if our welfare function regards only the income of that group as

contributing to welfare. If there is time discounting, the earlier gains weigh heavier than the later losses. Even so, there must be an absolute time horizon beyond which the present value of future gains or losses is zero before there can be a possibility of the gains from such redistribution outweighing the losses.<sup>1</sup>

In view of the extreme importance, therefore, even for the initially favored groups, of avoiding redistributions which lower the rate of growth of the total product, our massive ignorance concerning the effects of any kind of redistribution on the rate of growth is a matter for serious concern. It means that almost all major decisions of eco-

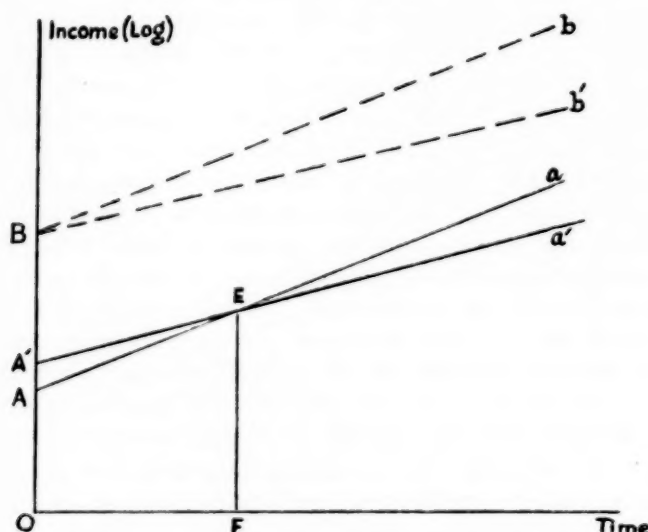


FIGURE 1

nomic policy have to be taken in ignorance of the most important effect which they have. It means that welfare economics has been forced to confine itself to what are almost trivial problems by comparison with the real issues in almost any policy decision. It means, also, that economic ethics has been seriously distorted by static and short-run criteria of value. "Justice" has been thought of too much in

<sup>1</sup> Let  $A_1 = K_1 e^{\alpha t}$  be the growth equation before the redistribution, and  $A_2 = K_2 e^{\beta t}$  be the growth equation after redistribution. Then when  $A_1 = A_2$ ,  $K_1 e^{\alpha t} = K_2 e^{\beta t}$ , or

$$t = \frac{\log K_2 - \log K_1}{\alpha - \beta}. \text{ To get an idea of the orders of magnitude involved suppose } \frac{K_2}{K_1} = 1.1,$$

$\alpha - \beta = 0.01$ . That is, a 10 per cent rise in the initial income of the A-group causes a drop of one percentage point in the rate of growth. Then  $t = 9.5$  years—by no means a long time in the light of policy decisions!

terms of the division of a fixed pie rather than in terms of encouraging the baking of more pies. One of the simplest ways of dealing with an important area of ignorance is simply to ignore it. It is not therefore always a popular thing to do to call attention to such areas, especially when it is by no means clear what are the avenues of research by which the ignorance may be remedied. In the long run, however, it may be of more value to society to call attention to an unfelt need than to satisfy the felt wants.

What emerges from the over-all discussion, then, is that in the field of distribution, as in the field of production, man is not helpless in the grip of inflexible forces of historical development, but that his development depends on his behavior and his behavior is subject to rational analysis and to change in the light of that analysis. The great task of the social scientist is to find where are the aspects of behavior which make a real difference, even though the efforts may often be totally different from what is immediately apparent. The problem of ecological succession in social life can then be brought more under man's control, and social pressure of various kinds can be applied in the direction of molding the equilibrium closer to some heart's desire. But to what or whose heart's desire is a question for other occasion.



## SIGNIFICANCE AND LIMITATIONS OF CONTEMPORARY DISTRIBUTION THEORY

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By contemporary distribution theory we presumably mean a qualified marginal productivity theory; that is to say, a combination of the marginal productivity theory with other analytical elements. I will first try to give a brief list of the main elements of which various contemporary writers have taken account in their work. For the sake of simplicity I shall call this list of items, supplemented by general hints as to how they might be fitted together, a sketch of the "contemporary theory of distribution." Theorists disagree concerning the relative significance of these various analytical elements and also as to the most convenient place of each of these in a general theoretical construction. Consequently, what I will call the contemporary theory of distribution has many alternative versions. But I hope I am not unduly arbitrary in suggesting that these specific versions may be derived from my sketch by placing the primary emphasis on one or the other element and by linking the various elements in different ways. After drawing this sketch, I shall turn to an appraisal of the kind of theory which it describes. The main part of the paper will be concerned with problems of appraisal.

### *I. Sketch of the Theory*

1. The demand for factors of production is related to the concept of the marginal value (or revenue) product.

2. It is recognized, however, that the demand behavior of firms in the factor markets must be derived from estimated or expected (not from actual) marginal value product functions, and that the problem of business expectations is a very thorny problem indeed. It is not clear at all to what extent the usual concepts of the probability calculus are applicable to the problem of linking expectations to past experience. However, in the subsequent paragraphs I shall assume that businessmen do have something in the nature of best guesses of the marginal value product functions which they face and in this sense I will speak of the businessman's expected marginal value product function.

3. Contemporary theory recognizes that the expected marginal value product functions do not uniquely determine the demand for factors of production. Allowance is made for ranges of indeterminateness

stemming from discontinuities in the value product functions. Where ranges of discontinuity exist, profit maximization cannot be expressed in terms of marginal functions alone. These discontinuities are more important in the short run than in the long run, as a consequence of rather inflexible factor proportions in the short run. But even in the short run, discontinuities may not predominate if we consider a fairly large sector of the economy because cross-sectionwise there always exists variability of factor proportions.

4. Further qualifications are sometimes introduced to take account of entrepreneurial objectives which can usefully be distinguished from the profit objective in the technical sense, although it is always possible to argue that a sufficiently long-run and comprehensive interpretation of the profit objective includes these other objectives. Liquidity objectives and also many so-called "noneconomic objectives" are examples for this. At any rate, to the extent that the firm is not viewed as attempting to maximize its profits, its demand for factors cannot be derived from expected marginal value product functions.

5. It is recognized that whenever the firm possesses monopsony power there exists a further reason why marginal value product functions do not uniquely determine the demand behavior of the firm. The demand behavior of a monopsonist is not uniquely determined by the marginal worth of a service to him. But in accordance with the theory of monopsony, the marginal value product functions will of course enter importantly into the determination of the factor purchase of monopsonistic firms.<sup>1</sup>

6. It is recognized that in the contemporary world the supply of factors is largely determined by group action into which individual preferences enter merely indirectly. The supply price of labor services and also their quality depend importantly on decisions which are made by unions and they depend indirectly on the attitudes of governments. Monetary and fiscal policy plays a part in influencing the supply price of credit and thereby of funds usable for physical investment. Given the supply prices of factors, the amount or quantities supplied are determined by individual decisions, within limits set by the legal and institutional framework.

7. When the theory is used for the analysis of problems pertaining to the economy as a whole, it is not overlooked that changes in supply prices may bring about changes on the demand side. This is partly because changes in supply prices (e.g., wage changes) are apt to influence total effective demand and thereby the expected value product

<sup>1</sup> The marginal function corresponding to the supply function of the factor will be equated with the marginal value product function. The abscissa of this intersection expresses the quantity of the factor purchase and the corresponding ordinate of the supply function expresses the factor price.

functions, and partly because changes in relative factor prices may exert an influence on the nature of innovations. However, some of these interactions call for *ad hoc* appraisal by informal methods, in view of the special circumstances in which the problem arises. We possess no formal theory that would lead to general propositions on whether the effect of autonomous changes in factor prices on total income is more or less than offset or even reinforced by induced shifts in the expected marginal value product functions.

These, it seems to me, are the main ingredients of contemporary distribution theory. On the demand side, this is a marginal productivity theory qualified by considerations pertaining to the nature of expectations with respect to the marginal value product, to discontinuities, to liquidity and safety objectives, to monopsony, and to noneconomic objectives. On the supply side, it is a theory taking account of institutional factors which influence supply prices, as well as of the attempt of individual suppliers to pursue their own objectives. Furthermore, it is a theory which calls attention to the fact that for the economy as a whole the demand side of factor markets is not independent of their supply side, although there exists at present no formal apparatus for a satisfactory general analysis of the nature of this interdependence.

## II. *Contribution of the Theory to Ideological Consistency*

In an appraisal of a theory or of a type of approach, it is necessary to choose the standards by which success or failure can be judged. One possible standard is provided by the objective of finding empirically testable relations between variables, such as are useful for explaining the past and for predicting the future. I will return to this in the subsequent section. Before so doing, I would like to express the opinion that in the social sciences the discovery of such empirical regularities is not the only legitimate objective of theorizing.

Each historical era is characterized by the fact that certain principles of conduct have acquired significance in it. Principles of this sort can be expressed with great generality and in this case they possess many implications. Revealing these logical implications—corollaries to general principles—is a significant theoretical objective, irrespective of how closely it ties in with finding empirical regularities and of predicting the future. To illustrate this with an example, it takes professional reasoning to establish the proposition that perfect competition implies the equality of price and marginal cost. Without understanding this proposition we would be ill-equipped for developing an articulate attitude concerning either the actual or the desirable degree of competition in a society. I suppose that everyone has had the occasional experience of having stood for some proposition and against another and

of having later realized that the second proposition is merely the first in disguise. In any society there should be specialists who are capable of clarifying issues of this kind in their own fields of specialization. In a society in which the competitive ideal, along with others, possesses considerable significance, it is important to know that competition in the pure form logically implies a definite relationship between price and marginal cost. Most of us are willing to make the judgment of value that a service is rendered by eliminating inconsistencies from ideologies and, generally speaking, from systems of thought. The link between this objective and the objective of discovering empirical regularities (or of predicting) is in many cases exceedingly weak.

It must of course be admitted that the empirical and the logical type of reasoning always overlap in economic theory. Needless to say, empirical elements supplement the purely logical analysis when the logical analysis merely aims at clearing the way for empirical investigation. But the two are not entirely unrelated—they overlap to some extent—even when the main objective of logical analysis is simply that of rendering a system of principles more consistent. Even where the analytical objective is that of establishing corollaries to principles of conduct, the analysis implies an empirical judgment as to the significance of these principles of conduct in a given society. But the results of the conduct of individuals may not be predictable simply by the method of developing the corollaries to a limited number of significant principles, because we may be incapable of gauging the relative quantitative importance of any one of these principles. Yet to conclude from this that it is idle to reveal the logical connections between principles of behavior would mean placing a premium on fuzzy objectives and on confused ideologies.

Let us now try to appraise the theory of distribution by its ability to throw light on the logical implications of certain principles which have acquired significance in the Western World. The marginal productivity elements of the theory of distribution undoubtedly establish an important corollary to the profit-maximization principle. A person has inconsistent views about the profit principle if he fails to see that, aside from the discontinuities previously mentioned, profit maximization implies buying factor-quantities which make the marginal cost of any factor-purchase equal to the marginal value product of the factor; and, aside from monopsony power, the marginal cost of any factor-purchase is the same thing as the price of the factor. While our societies cannot simply be characterized profit maximizing, the profit principle is one of several principles which do play an important role in these societies. It is difficult, if not impossible, to appraise the standards by which the Western World is governed, without going through the exercise of

understanding what is implied in profit maximization in its pure form, with and without pure competition. The marginal productivity elements of distribution theory do contribute to clarifying this. The theory stands up well by this criterion.

However, our economies are not governed by the profit principle alone. Contemporary distribution theory brings out the logical implications of other relevant principles of conduct much less effectively than those of the profit principle. This is not a specific weakness of distribution theory but primarily a consequence of the fact that at present the other principles of conduct are much less clearly crystallized. Mid-twentieth century Western societies seem to have an ideology of modified capitalism but they still are struggling with the task of making definite the nature and the extent of the modifications. These societies have certain distributive (or equalitarian) objectives and security objectives, and they try to let the capitalist process operate under a set of constraints which expresses the contemporary degree of equality-mindedness and of security-mindedness. The change in attitude is partly a consequence of the fact that the concentration of large masses in a few population centers as well as the spread of schooling has rendered equality- and security-minded groups much more vocal. However, I believe that security or safety-mindedness is at the same time partly rooted in different factors, some of which belong in the theory of oligopoly. But the equalitarian and the security constraints under which the profit motive is placed are not yet well formulated or ideologically articulated. Distribution theory reflects this by the relative vagueness of all its elements other than marginal productivity; that is to say, by the relative vagueness of the corollaries to all principles other than the profit-maximization principle.

To be sure, distribution theory recognizes that, even in the analysis of entrepreneurial motivation, security or safety objectives call for modifying the simpler versions of the profit-maximization axiom. It is also recognized that the interpretation of union behavior on the supply side of the labor market must take account of more than the wage objectives of labor. In fact, the treatment of these other elements is becoming increasingly explicit in contemporary distribution theories. But even though more is now being said about these other elements, what is said is much vaguer and more tentative than the analysis of the marginal productivity implications of the profit principle. The other principles have not yet reached ideological maturity.

Some believe that the equality and security constraints under which twentieth century enterprise systems operate will never crystallize to definite principles or to widely accepted norms of well-defined character. Such a view comes close to suggesting that on this side of the



Iron Curtain we live in a process of decomposition. By aiming at an ever increasing degree of equality and security, we shall destroy incentives and with them the enterprise system and subsequently we shall land in state socialism. If this view should turn out to be right, our social theories in general and our distribution theory in particular will increasingly become theories of a decadent age during which an old ideology slowly dies to make room for something new that is not yet here. More specifically, in this case we will continue to have qualified marginal productivity theories with ever increasing emphasis on increasing vague qualifications. Yet it may not be taken for granted that these predictions are right. It is quite possible that the Western World is developing a twentieth century version of the enterprise system the principles of which will in due time become reasonably articulate. But if this will turn out to be a new system rather than simply the slow decomposition of earlier modes of living, then certain new norms must become widely accepted.<sup>2</sup> These norms must become sufficiently definite to determine the character as well as the degree of the equalitarian constraints and of the security constraints under which the profit principle is permitted to work. Furthermore, the character and the degree of these constraints must be compatible with incentives such as are required for the long-run survival of the economies in question. If this more optimistic view should prove correct, the corollaries of the new norms (or "constraints") will in due time become more articulate constituents of our distribution theories. They may never become as precisely expressible and quantifiable as the profitability norms because, while profit itself is a quantity, the essential content of equality-inequality and of security-insecurity concepts is merely related to certain quantifiable concepts. But the more stabilized a set of social characteristics becomes, the more can be done to incorporate it in an analytical framework.

### III. *Predictive Value of the Theory*

Let us now turn to an appraisal of contemporary distribution theory by its usefulness for the purpose of prediction. From the outset we must be aware of the fact that the predictive usefulness of economic and social theory in general has so far remained very limited. The analytical systems of the social sciences are incomplete; they do not include all relevant factors as variables of a theory. Some significant factors stay outside the formal framework and these constitute the

<sup>2</sup> I am implying here that in retrospect a set of social arrangements is not called a system unless something in the nature of a "classical" period is discernible during which the main characteristics of these arrangements were fairly stable. Of course social institutions are always changing and therefore the distinction here implied is not very sharp. But I do not believe that it is meaningless.

"environment" in which the analytical mechanism operates. The environment is always in flux and consequently it is inadmissible to use these analytical systems for prediction without making informal, quasi-intuitive allowances for environmental changes. In this respect the more highly developed sciences are far superior. They make it possible either to neutralize the environment or to work it into the theories themselves (in which case it ceases to be an environment in our sense). In the present stage of economic theorizing, predictive usefulness means at best that the theory in question frequently leads to correct guesses when rather plausible allowances are made for changing environmental factors. This is the reason why in economics it does not at present seem worth while carefully to distinguish between empirically derived theories which explain merely the past and empirically derived theories which at the same time can be used for projections into the future. The predictive economic theories all merely explain the past and, if put to predictive use, they must be employed with informal allowances for changing external factors. On the other hand, with such allowances any theory explaining the past can be used for guesswork concerning future events. What about the predictive usefulness of distribution theory, in this modest sense?

The answer depends on what we are trying to predict. It would of course be unreasonable to list here dozens of questions and then to try to appraise the predictive performance of the theory with respect to each of these. However, I feel that the performance of the theory is mixed—neither uniformly good nor uniformly bad—and I will illustrate this with two significant macroeconomic problems of our times. With respect to one of these, the theory performs reasonably well; with respect to the other poorly. An important specific-equilibrium problem, to which the theory can usefully be applied, will also be mentioned.

Let us add to the usual assumptions of contemporary distribution theory the further assumptions that a great many innovations are of induced character and that relative scarcity (expensiveness) of labor induces primarily labor-saving innovations while relative scarcity (expensiveness) of capital induces primarily capital-saving innovations. This is a very plausible set of assumptions which, I think, was first used explicitly by Professor J. R. Hicks, in his *Theory of Wages* (Chapter VI). If these assumptions are introduced into the usual framework of distribution theory, the inference suggests itself that processes which one ordinarily would expect to result in substantial long-run changes of relative shares before taxes (i.e., of relative factor costs) will in reality result in surprisingly small changes. In the course of technological progress the productivity functions of labor

may shift up at a very different rate from those of capital, thus creating a relative shortage in labor or in capital and hence changing the relative shares. But if relative labor shortage induces primarily labor-saving innovations and vice versa, then in the long run the shifts in the labor-productivity functions are unlikely to get very much out of line with the shifts of the capital-productivity functions. Or if, as is likely to be the case, a relative shortage in some factor tends to develop because of different rates of growth in the various factor supplies, then technological progress will lead not to approximately equal shifts but to offsetting shifts in the various productivity functions. It will lead to greater upward shifts in the productivity of the relatively abundant factors than in that of the scarce factors, thus reducing the relative scarcity. Hicks concluded twenty years ago that, with such a response mechanism at work, technological progress in combination with differential rates of growth in factor supplies may result in comparatively small long-run changes in relative shares.

To this I would like to add that a broadening or extension of this same set of assumptions leads one to expect that union pressure on wage rates also results in much smaller changes in relative shares than might appear to be likely a priori.<sup>3</sup> The process by which unions could change relative shares is that of creating relative labor scarcity (high real wage cost). Part of the pressure on money wages does not result in pressure on real wage rates because of price increases. Yet it is very likely that real wage rates also tend to be raised. This is like creating relative labor scarcity, from which a change in distributive shares may be expected. But if relative labor scarcity induces labor-saving innovations the limits within which distributive shares before taxes (relative factor costs) can change may prove quite narrow.

The available statistical materials are neither sufficiently detailed nor sufficiently reliable to permit of categorical conclusions concerning long-run tendencies in distributive shares. But most economists might agree that these changes have been comparatively small if we consider the strength of the forces at work to raise the share of labor in national income. By and large, real wage rates have tended to rise at the rate of the long-run increase of output per man-hour.<sup>4</sup> This is precisely what would be expected on the basis of the productivity theories of distribution if these are supplemented by a theory of induced innovations. In this respect the predictive performance of the theory is not

<sup>3</sup> For these broadened assumptions, cf. my *Competition Among the Few* (New York, 1949), pp. 311-321, particularly p. 319.

<sup>4</sup> For a recent discussion of the corrections that must be made if one focuses one's attention simply on trends in the share of a factor rather than on unit income rates, cf. E. H. Phelps Brown and P. E. Hart, "The Share of Wages in National Income," *Economic Journal*, June, 1952.

bad, provided that we do not set our standards higher than is justifiable for the appraisal of an economic or social theory. Alternative theoretical explanations of the same facts are of course not excluded, but it seems to me that in the present case the predictive value of these would have been smaller.

Unionization has had far-reaching social and economic consequences but it is questionable whether it has changed the relative position of the high- and the low-income classes. On the other hand, graduated taxation undoubtedly has changed these relative positions. In the twentieth-century Western World, income and wealth are being redistributed by means of graduated taxation—mostly at the expense of persons belonging in the top percentiles of the population who make strategic business decisions.<sup>8</sup> At the same time this age has come to emphasize very strongly the objective of high employment, without having so far developed a general attitude as to how much cyclical unemployment it is willing to accept in order to avoid a comprehensive system of anti-inflationary direct controls. This second dilemma—arising from the impossibility of guaranteeing full employment without rigorously controlling wages and prices—does not perhaps belong in the area of distribution theory. But the dilemma to which highly graduated taxation gives rise surely should be a problem of the theory of distribution. In reality the theory has little to say about the probable consequences of contemporary tax policies. This at present is perhaps the main weakness of distribution theory.

At what point do equalitarian tax policies start seriously to interfere with incentives? These policies exert many influences, which, however, can at present be distinguished from each other only in abstract theorizing. The marginal influence of income taxes, viewed in isolation, is clearly harmful to incentives because it reduces the reward for additional work and for additional willingness to accept risk. In terms of welfare economics, the effort-leisure margin becomes distorted. The inframarginal effect of taxes, again viewed in isolation, is likely to be favorable for incentives. By this I mean that if the same burden were levied on each individual as a lump-sum tax (with a marginal rate of zero), the incentive would be created to work more and to accept additional risks in order to offset the loss suffered through the lump-sum tax. For the same reason it is possible that the beneficiaries of "redistribution via graduated taxation" reduce their effort. They can better afford to reduce it, so to speak. But it is also possible that improvement in their living conditions increases their productivity per unit of effort. By now we already are faced with sev-

<sup>8</sup> The share of this group has decreased also in personal income before taxes but on the other hand undistributed corporate profits have increased relatively to personal income. If undistributed profits are regarded as constituting income for the shareholders, the income share of the top groups may not have changed much before taxes.



eral effects going in opposite directions. But this is not all. On a monetary level of analysis, further effects could be distinguished which go in opposite directions. Equalitarian policies presumably tend to raise the propensity to consume at any given output level, thereby reducing the degree of uncertainty which attaches to business expectations. This may result in increased willingness to invest enough for filling the remaining savings gap at full employment. For consumption demand is a more stable, a more predictable, constituent of total demand than is the demand coming from other investors.<sup>6</sup> Yet it can of course not be taken for granted that raising the propensity to consume and thereby reducing uncertainty makes investors more willing to fill the remaining savings gap where the change is brought about by taxing the marginal earnings or producers. Consequently, it is not clear whether collecting the same tax revenue with higher tax graduation has expansionary (inflationary) or deflationary consequences.

It would be hopeless to try to form an opinion of the relative strength of these influences on the basis of contemporary distribution theory. Up to some point equalitarian objectives and security objectives may well be complementary with the objective of favorable long-run trends in productivity. But up to what point? Where do we have to start weighing competing objectives against one another? And about how much are we weighing on the one side of the scale against how much on the other? There certainly must exist a degree of tax graduation which produces severely harmful consequences on balance. A marginally confiscatory tax destroys all pecuniary incentive for further effort, whatever other effects it may have. Or, rather, such a tax is compatible with incentives, beyond the level at which it gets confiscatory, merely as a consequence of loopholes from which no tax system is free. Moreover, it is safe to assume that in the long run considerably less than a confiscatory marginal rate is required for making the adverse consequences predominate.<sup>7</sup> But in the appraisal of finer problems one is left to guesswork and feel with little aid from the theory of distribution. And what is required in practice is an approximate quantitative appraisal of these finer points.

After all, it would be difficult to lend much plausibility to the state-

<sup>6</sup> It is more usual to argue that a high propensity to consume may be conducive to the full use of resources because offsets to diminishing returns and hence investment opportunities are limited for any given period of time. However, Western economies have not typically been running into historically diminishing returns. Any such tendency would have to manifest itself very gradually. It would be unconvincing to interpret interludes with low profitability mainly in terms of the law of diminishing returns. It seems preferable to state that underutilization is a consequence of unsatisfactory profit expectations in relation to the existing degree of uncertainty and to place quite a bit of emphasis on the element of uncertainty (which stems in good part from the unpredictability of the structure of total demand and of output).

<sup>7</sup> Very high marginal rates which are known to apply merely to a period of short duration may not destroy incentives, provided that improvements in financial status are expected significantly to outlast the period.



ment that the long-run functioning of nineteenth-century and early twentieth-century capitalism brought a worsening of the relative position of the poor in general as compared to the rich in general, while the system clearly did bring a substantial rise in the average standard of living. However, the dominant Western ideology became permeated by the idea that the prompt elimination of certain hardships of the relatively poor deserves high priority, regardless of whether the long-run rise in productivity would in due time automatically reduce or eliminate these hardships. This, I think, is an essential characteristic of Western ideological history, which of course was substantially influenced by the increasing geographical concentration and increasing literacy of people belonging in the relatively low-income groups. But since neither an infinite nor a zero rate of time-preference is a reasonable attitude in matters of social policy, the contemporary world can ill afford to neglect the effect of equalitarian tax policies on productivity trends. In this respect the formal apparatus of distribution theory is of little help, although even here the theory is useful for separating from each other the various aspects of the problem and for logically clarifying these.

As was said before, in some other respects the predictive performance of the theory is more satisfactory. The problem of trends in relative shares before taxes, for the economy as a whole, was given as an example. Another example is the tendency toward either low wage rates or few employment opportunities (or both) in specific industries that experience comparatively unfavorable trends in value productivity. For the appraisal of these and some other problems, the theory does possess the kind of limited or qualified predictive usefulness which it is reasonable to expect from an economic theory. Furthermore, quite aside from the question of prediction, the theory does have the merit of clearly developing the corollaries to the profit principle which has stayed one of the central principles of contemporary Western societies. It develops the corollaries to other principles less neatly, but at the present stage the other principles are somewhat shapeless and it would be too much to ask that an economic theory should show great formal elegance in revealing the implications of rather ill-defined sociological principles. Not in every respect need this greatly reduce the usefulness of the theory for informed guesswork (that is, its predictive usefulness). This is because not all observable results are greatly influenced by all major principles of conduct involved in decision making. Some results may be determined mainly by specific principles of behavior the relevant corollaries of which are successfully developed by the theory in question.

## DISCUSSION

HAROLD M. LEVINSON: On the basis of the issues raised in both of these papers, we seem to be agreed, I take it, that by the present status of distribution theory we mean primarily the marginal productivity theory as an explanation of the functional distribution of income. Both papers have also made important reference to the fact that our knowledge of the effects of redistribution policies on the size and rate of growth of income is abysmally poor, and I think there is probably no one who would dispute that view. Nor can there be any serious question about the value of the theory both as a frame of reference and as a criterion by which the actual operations of the economy may be judged. I shall confine my remarks, therefore, to the issues raised regarding the adequacy of the theory for descriptive and predictive purposes. By way of preliminary summary, I might say that I am in substantial agreement with Professor Fellner's views and in rather strong disagreement with those of Professor Boulding.

Turning first to the statement of the present status of the theory itself as sketched by Professor Fellner, it seems to me to be an excellent summary both of the theory and of its current weaknesses. He points out that significant competitive imperfections exist in the factor markets and that for the economy as a whole aggregate demand and aggregate supply are not independent variables; yet he appears to feel that these deficiencies do not destroy the essential validity of the theory for purposes of explaining the basic forces determining the distribution of income. Further, he nowhere holds that the theory is necessarily applicable only under conditions of full employment. If I have interpreted Professor Fellner's views on these aspects of the theory correctly, I am in full agreement with them.

I also feel that Professor Fellner is right in his view that the marginal productivity theory is given empirical support by the fact that the shares of income going to labor and to profits have not changed significantly over the past twenty-five years or more, despite a very great increase in labor's bargaining power and in the level of money wages. At this point, however, it is important to note the distinction between the effects of union wage pressure on prices and techniques and the type of calculations which lead businessmen to make such adjustments. With respect to the effects of wage pressure, the evidence is certainly strong that the generalizations of the productivity theory are, in the main, correct. It does not necessarily follow, however, at least with respect to price adjustments, that the type of calculations described by marginalism are thereby correct. I have in mind the fact that practically all empirical studies made of business pricing policies have indicated that businessmen appear to follow some type of cost-plus-markup method of pricing rather than what we may call a marginal approach. Assuming that cost-plus pricing is in fact widely used, the price reactions to wage pressure postulated by marginalism would be precisely the same, without necessarily indicating

thereby that marginal calculations are being used. It is strange that despite the empirical evidence we have, no attempt has been made to integrate cost-plus pricing into distribution theory; rather, our major emphasis has been along lines of attempting to demonstrate that somehow cost-plus formulas ultimately may be reduced to marginalism. This may be true, but thus far I have seen no convincing demonstration of it.

In rather sharp contrast to Professor Fellner's view that the marginal productivity theory has reasonably good value, at least for some purposes, Professor Boulding states that "the demise of the wages fund theory left the classical dynamics in ruins, and no adequate macroeconomic theory has ever filled the gap." Leaving aside the issue of what constitutes an "adequate" theory, a large measure of the apparent disagreement may be attributed to the fact that Professor Boulding is concerned with the adequacies of the theory as a dynamic tool, while Professor Fellner's analysis is concerned with it primarily in a static, or equilibrium, position.

Professor Boulding's major objection centers on the fact that, when analyzing the economy as a whole in a dynamic situation, the aggregate demand functions for factors are not independent of their supply. If one assumes a condition of less than full employment, for example, and if it is further assumed that the money wage level will continue to drop as long as unemployment persists, any model in which the level of employment is a function of the marginal productivity of labor may not yield a determinate equilibrium. Any equilibrium below full employment must introduce some external rigidity not a part of the system itself.

Now, I think that practically all shades of economic opinion will agree that Professor Boulding's objection in this respect is well taken. It seems to me, however, that this criticism, which is based upon the fact that at any given time the entire system is internally interdependent, represents no basis for concluding, as Professor Boulding does, that the marginal productivity theory is of no value in explaining what he calls the magnificent dynamics of income distribution over a broad period of time. For the latter purposes, what is needed, it seems to me, is a theory which will explain long-run changes in factor prices and in the functional distribution of income as we move from one position of equilibrium to another over time. For this purpose, I would hold to precisely the opposite view; namely, that the deficiencies of the classical and Marxian dynamics are substantially met by the marginal productivity theory. Wages have not fallen to subsistence precisely because improving techniques have raised the productivity of labor faster than a rising population has reduced it; profits have not fallen to zero precisely because the enormous increase in capital has been largely matched by improvements in its use; rent has not swelled to gobble up the fruits of progress precisely because land-saving techniques as well as changes in consumption patterns away from land-using products have counterbalanced the inevitable rise in demand for land postulated by the classical economists. It seems to me that the productivity theory gives us a perfectly logical explanation of what has in fact happened in the more highly industrialized countries and a perfectly logical explanation of wherein the older theories were wrong.

I would like to turn finally to Professor Boulding's suggested distribution model. As I understand it, his view is that the distribution of income as between wages and nonwages is determined, at least in the long run, by the dividends function; that is, by the decisions of businesses in the aggregate to distribute a larger or smaller amount of dividends out of profits. This generalization is derived from his asset identity equation which reduces, if in the long run we neglect changes in consumer credit and shifts in cash balances between households and business units, to  $W = C + I_e - D$ ; that is, that the share of goods going to wages is equal to total consumption plus externally financed investment (these two, then, representing the total claims against goods by households) less the total of nonwages distributed to households. It follows from this that, other things constant, an increase in  $D$  will decrease  $W$ ; that is, an increase in nonwage distribution will decrease the wages share and increase the nonwage share. Since rent and interest may be viewed as contractual payments, the major variable affecting the nonwage share is dividends. Thus, to use Professor Boulding's example, profits need not disappear in the long run, even in a stationary state, but can be maintained indefinitely at some level above zero as long as businesses are willing to continue to distribute all of their profits in the form of dividends. On the other hand, if in a stationary state firms insist upon distributing some constant proportion of their earnings, profits must eventually fall to zero. In terms of the long-run dynamics of the economy, this means that capitalism can maintain itself as long as the behavior functions of businessmen are such that at some level of profits above zero they will attempt no net business savings.

I must confess that this concept strikes me as so novel that I am not at all sure I grasp fully what Professor Boulding may have in mind. One possible interpretation is that *ex ante* business decisions to withhold or to distribute some expected level of profits can have an important effect on the *ex post* level of profits, resulting in the *ex post* level being higher or lower than the planned level. This is, of course, quite possible, although neither the amount nor the direction of change can be determined unless appropriate assumptions are made regarding the use to which the funds will be put by business firms vis-à-vis households.

Professor Boulding clearly implies, however, that the relationship between dividends and profits is much more direct than this, to the extent that a given change in dividends will bring about a substantially equal change in profits. This view is apparently based on his asset identity equation, by which changes in  $D$  are presumed to cause equivalent changes in  $W$ . The first objection which may be made, it seems to me, is that an increase in dividends may simply be counterbalanced by an equivalent increase in externally financed investment or in cash balances held by households, thereby leaving  $W$  unchanged.

A much more basic difficulty arises from the fact that Professor Boulding appears to be saying, in effect, that there are no determinants of the level of profits except the decisions of businessmen themselves as to the particular level of profits at which they will attempt no net business savings. If, for example, some level of profits above zero can be maintained even in a stationary state by the process of distributing all earnings, there is presumably no reason why



this level cannot be as high or as low as businesses desire, limited only by the level of profits at which the process was started.

This view of the process of profit determination clearly neglects completely the significance of the operation of competitive forces as a constraint on the level of profits and, by the same token, as the basic (though not necessarily the only) determinant of the distribution of income between profits and other distributive shares. This is true even if we recognize that the prices of various factors may be largely determined by group decisions, since the quantity of factors employed at these prices is still almost completely determined by competitive pressures. If competition for productive factors and for sales exists, therefore, the share of income going to wages and nonwages is not arbitrarily determined but is set in the long run by forces outside the control of business firms. In a world of uncertainty, competition will reduce the rate of profit to the minimum level required to call forth the supply of risk capital necessary to meet the effective demands of society for goods. In the stationary state, with no uncertainty, profits will be reduced to zero even if all profits were previously distributed, since any positive rate of return will attract additional capital, thereby forcing product prices down and/or factor prices up. Any profits continuing to exist would represent a monopoly return. If Professor Boulding is to hold, as I believe he does, that profits can be maintained above zero even in the absence of uncertainty, it follows that competitive forces are not considered as constraints in his system, and that income distribution becomes purely a matter of the discretion of businessmen or of the relative bargaining power of various factors in the economy. I do not believe, as I have already indicated, that the empirical evidence of past distribution trends gives any support to this view.

Professor Boulding makes the final observation that the distribution of income which emerges from his analysis is determined by how people behave and is not predetermined by any iron physical laws, such as those implied by the classical, the Marxist, or the marginal school. It seems to me that such a distinction cannot properly be made. There is no system of distribution which is not based on how people behave and which cannot be changed by inducing people to behave differently. The classical theory depends (in part) upon assumptions regarding how people will behave with respect to having children; the Marxian theory depends (in part) upon assumptions regarding the tendency of capitalists to accumulate; and the marginal productivity theory depends (in part) upon assumptions regarding profit maximization. If business firms and other groups could be induced to behave differently and in a manner preferred by society, any desired distribution of income could be obtained. Unfortunately, I am afraid the failings of society cannot be solved by a change in our theories of distribution.

EDWARD C. BUDD: Professor Fellner has presented us with an admirable summary of current marginal productivity theory, which, in one form or another, still lays claim to being "the" theory of distribution, despite all of the qualifications and amendments which he enumerates. In his discussion of the contribution of distribution theory to consistency in thought, however,



I find the term ideology ambiguous: it seems to apply to the ethical standards of a society as well as to its behavior principles. In this connection it seems to me important to draw a distinction among principles of economic behavior or behavior applicable to individuals and groups in their economic relations; the motivation and political behavior of individuals and social groups, together with the results of their actions, such as the rules and restraints they succeed in establishing, largely, but not entirely, through the means of government, which serve to channel economic behavior; and the norms or goals which should govern social choices made. Professor Fellner's discussion is largely confined to behavior principles in the first rather than in the second category; the dominant behavior pattern of entrepreneurs being profit maximization, qualified by security and liquidity considerations; union behavior being affected by such principles as security and equalization of incomes, as well as income maximization of its members. He points out that distribution theory has been quite successful in deducing the logical consequences of one particular kind of behavior—profit maximization—while conceding that its success with respect to other kinds of behavior is less conspicuous, if not quite absent. I do not believe that this latter failure arises merely because of the belief of economists that profit maximization is the most important type of business behavior. As Fellner points out, we really lack any gauge for judging either its importance or the relative importance of other principles. Nor can it be explained on the grounds that other motives are insufficiently crystallized in individual or group behavior to make them significant. This failure to analyze other principles of conduct arises in part because economists have not devoted sufficient time to their investigation and have concentrated primarily on drawing the marginal productivity corollaries from the principle of profit maximization.

The real reason for the increasing vagueness of distribution theory lies in my second category: the political and social struggle over how the rules or principles of economic behavior are to be modified by group or collective action—the problem of institutional change, if you like. An example would be the degree to which the socially desired objectives of security and equality are to be permitted to change the competitive “rules of the game.” Two elements in this process can be distinguished: conflict over social norms or objectives that are to be promoted and the struggle over implementing these objectives by specific policy measures.

In this connection, Professor Fellner's distinction between the decomposition of a society and the achievement of a new social synthesis based upon some type of enterprise system seems to me to be misleading in its normative implications. It implies either the unverified assumption that profit maximization is and will continue to be such a dominant principle of conduct that new norms must be developed within this constraint (that is, in Fellner's terminology, the norms “must be compatible with incentives”) or the normative judgment that profit-maximizing behavior should be incorporated in such a synthesis.

The following is suggested as a more neutral way of phrasing the point: societies have been and are continuously in a process of change—involving

changes in values, in institutions, in behavior. Undoubtedly, as a result of some kind of social and political process, new norms or standards, together with their associated restraints, are being developed and will continue to be developed, or perhaps even the old ones preserved. The various objectives developed, however, may be competitive with one another; one of a variety of social goals can rarely be "maximized," so to speak, independently of the others. Or it may be that particular kinds of behavior patterns, together with the institutions under which they operate, place restraints on, or are inconsistent with, the achievement of the postulated goals. For example, increased equality and security may well be inconsistent with maximum output and progress because of the effect on incentives as they operate under present institutions. It is, of course, a function of theory, including distribution theory, to point up these relations among objectives and between objectives and economic behavior; so that either relative social choices can be made more intelligently or the requisite institutional change made, if the latter is possible. Professor Fellner engages in such an analysis with respect to the effect on incentives of equalizing incomes by progressive taxes. If, however, profit maximization is declining in significance, either because of the growing importance of other behavior patterns or because of the restraints imposed by society, it is incumbent upon economists to develop new theories from the new principles rather than being content with increasingly vague qualifications of the old one.

This brings me to a brief comment on the third category: that of the norms or values by which social restraints are decided, such as those relating to the allocation of resources, the level of resource utilization, stability, security, income distribution, economic progress, and freedom of consumer and occupational choice. I have already implied that, in this sense, profit maximization can hardly be considered as a norm in the same way in which, for example, equality in the distribution of income can be considered as a possible goal. Profit-maximizing behavior under given institutional arrangements merely affects the success of measures designed to implement the norm; it is instrumental rather than final. (For an alternative view, see the comment of Milton Friedman in *The Impact of the Union*, pages 346-347.) It is interesting to note, however, that marginal productivity theory (as well as competitive theory in general) has been used in support of a particular body of norms. While the use of marginal productivity to develop a particular kind of productivity ethics with respect to the norm of income distribution has pretty much gone out of fashion, its use in developing a norm of resource allocation or "efficiency," based upon free consumer choice and the operation of a price system, is still popular.

After this somewhat philosophic digression, I turn to a few comments on the theory of distribution as it relates to the determination of functional distribution shares, or what Professor Boulding has facetiously referred to as pseudo distribution. Here opinions diverge. While Fellner believes that a marginal productivity theory, supplemented, to be sure, by a theory of induced innovations, is sufficient to account for the observed stability of labor's share of income, Boulding asserts that marginal productivity analysis is inap-

plicable to the macroeconomic problem of distribution and develops an alternative theory of his own.

Boulding's attack on marginal productivity theory seems to me to be insufficient for his purpose; he disposes of it so far as a theory of effective demand is concerned but not with respect to distribution. He is correct in arguing that, in macroeconomics, marginal value product functions are not independent of factor prices and that a fall, say, in money wages may induce a fall in commodity prices, thus leaving real wages largely unchanged. However, accepting this rather simplified view does not require rejecting the proposition that the real wage is equal to the marginal product of labor. It is possible to set up a very simplified Keynesian model in which, even though real wages are independent of money wages, the former are still equal to the respective marginal products of labor. Suppose autonomous investment and the consumption function are given in real terms and determine the level of real output. The production function (assuming the capital stock is given in the short run) determines the volume of employment required to produce that output, and at that output, profit maximization of entrepreneurs requires that the real wage of labor is equal to its marginal product. As long as demand (in real terms) is unaffected by a fall in money wage rates (the essence of Boulding's argument), real output is unchanged, and the fall in money wage rates must lead to a proportionate fall in prices. Such a model, furthermore, does not require that money wages fall whenever there is unemployment. However, the marginal product of labor is still equal to the real wage rate and still determines the distribution between wage and nonwage incomes. Surely, Keynes did not discard marginal productivity doctrine in the *General Theory* (see, e.g., pages 18-19); and later writers, such as Klein, have developed models which include both the savings-investment determination of output and the theory of production. Boulding seems to be throwing out the baby with the bath water.

Boulding's own efforts at constructing a model of distribution, which relates the size of business distributions or transfer payments to the level of profits (or property incomes), suggest the difficulties inherent in the attempt to construct a macroeconomic theory of distribution independent of technical conditions of production or factor and commodity price determination. The objections raised against his formulation by Turvey, Johnston, and others are not adequately met, in my opinion, by a further distinction between internally and externally financed investment. I still believe that Boulding is engaging in an unconvincing, though ingenious, manipulation of accounting identities, without having introduced functional relations, based upon household or enterprise behavior, among the variables. Suppose dividend payments are increased and consumption and investment are assumed unchanged. Then in either the short run or the long run there must be either a redistribution of money balances between households and businesses, an increase in net business indebtedness to households, or an increased sale of equities (or stocks) to households. If it is the latter, then all that has happened is a bookkeeping change in the type of claim held by households against enterprises (from the surplus accounts to the capital stock accounts). In this connection it might

be worth while to inquire of Boulding as to the treatment of stock dividends in this model. If it is none of these "offsets," then it is only fair to ask Boulding, how do firms in the aggregate finance the payment of more dividends? Since every transaction has two sides, just how does the cash return from households to enterprises?

If, on the other hand, the effect is supposed to occur through a change in consumer or investment expenditures induced by increased dividend payments, the necessity for which Boulding denies elsewhere, then there may be some change in profits, but wage payments will also change as output changes, and how the change in income will be divided between wages and profits can only be settled with reference to the effects on factor and commodity prices.

Instead of using his theory to explain the currently interesting problem of share stability, Boulding instead stresses its importance for predicting the conditions under which there would be a positive level of profits in the stationary state, despite the absence of any evidence for the imminent or eventual appearance of such a state. This may be merely another (admittedly fancier, but far less obvious) way of saying that in the stationary state the rate of profit has to be equal to whatever is the rate of time preference (usually assumed by economists to be zero) and that dividend, rent, and interest payments must be equal to such profits. Applying Boulding's theory to evidence on share stability, however, we find that the increase in the ratio of corporate saving to corporate profits and the decrease in the ratio of rent, interest, and dividends to total property income which has occurred since the late twenties have been accompanied by the maintenance of the profit (or property) share of national income. Some force of much greater importance than increased private transfer payments must have been operating to maintain the property share.

But marginal productivity itself does not come through unscathed when confronted with secular share stability. Relative labor scarcity, both from the rapid growth of our capital stock and the increased importance of unions, would really lead to the expectation from such a model of a rising share for labor (unless the underlying production functions were of the Cobb-Douglas type). The introduction of an assumption of labor-saving innovations (or possibly some other modification) is necessary to account for the failure of labor's share to rise. While Fellner's assumption may be plausible in its own right, one wonders why we should get just the right flow of induced labor-saving innovations so as to leave labor's share actually unchanged. One gets the uneasy feeling of *ex post* rationalization rather than *ex ante* prediction. Furthermore, as Fellner himself recognizes, other theoretical formulations (such as, for example, some nonprofit maximizing uniform percentage markup over costs) may also be consistent with share stability.

One final comment. Boulding rejects marginal productivity theory because it is too "deterministic"; it emphasizes "iron physical laws" and excludes the role of human decisions. This seems to me to be only partly correct. The theory is based not only on the physical conditions of production but also on the individual behavior principle of profit maximization and on the institutional framework (e.g., the institution of private enterprise, the structure of

commodity and of labor markets). These latter do involve human decisions, and even the conditions of production can be modified over time by technical change. Thus distribution is under human control, even though a qualified marginal productivity doctrine is accepted. Recognition of the latter means merely that modification of income distribution requires different types of institutional changes from what would be needed were we to accept the hypothesis that distribution is affected by decisions on finance and on transfers rather than by decisions bearing on production and on factor and commodity price determination. In neither case is man helpless in the grip of external forces, historical or otherwise.

G. FINDLAY SHIRRAS: Professor Fellner in his paper said over the period which he studied wages and profits bore the same proportion at the beginning as at the end. I asked whether he had studied any other economy than that of the United States and he replied in the negative. I also asked whether he had excluded taxation and he said he had not.

In the *National Income and Product of the United States 1929-50* (Washington, D. C., 1951), wages and salaries or compensation of employees is in 1929, 55.5 per cent and in 1950, 60.3 per cent. For corporate profits, the figures in 1929 are 11.9 per cent before taxes and 10.2 per cent after; in 1950 they are 19.2 per cent before and 10.6 per cent after. (See the table on page 17 and the diagram on page 8. Also see page 50 in Simon Kuznets, *National Income—A Summary of Findings*, published by the National Bureau of Economic Research in 1946.)

It is suggested that net profits be taken and that the distribution of income in the U. K., the U. S., and certain other countries be studied. So heavy is taxation in the U. K. today that it would be wrong to say that (net) profits were the same today as at the beginning of the period relatively to wages.



# THE DISTRIBUTION OF GOVERNMENT BURDENS AND BENEFITS

## GENERAL EQUILIBRIUM ASPECTS OF INCIDENCE THEORY

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David Ricardo, in a letter to Hutches Trower, suggested that the theory of taxation is no less than the *raison d'être* of political economy. He wrote:

Political economy is only useful if it directs government to right measures in taxation. We very soon arrive at the knowledge that Agriculture, Commerce, and Manufactures flourish best when left without interference on the part of government, but the necessity which the state has for money to defray the expenses of its functions, imposes on it the obligation to raise taxes, and thus interference becomes absolutely necessary. It is here then that the most perfect knowledge of the science is required.<sup>1</sup>

Students of tax theory today will grant their colleagues that economics may be useful in some other contexts as well, but they will agree with Ricardo that a most perfect knowledge of the science—or, for that matter, a most perfect science—is required for our subject. If the state of taxation theory is far from perfect, the fault may lie with the students of taxation who have not studied their lesson; but it may lie also with the state of the science whose tools as yet are unequal to the task before us. My purpose in this paper is to set forth some of the basic problems and difficulties encountered in the theory of tax incidence and, in particular, in the general equilibrium analysis of the incidence problem.

### I

I begin with some points of definition and method, including the venerable distinction between incidence and effects, the distinction between what I like to refer to as absolute and differential incidence, and the role of partial and general equilibrium analysis in the incidence problem.

*Incidence Versus Effects.* The purpose of the entire analysis is to determine what changes in the economic setting follow from one or another tax and/or public expenditure policy. Formulated in terms of comparative statics, what we must do is to compare the equilibrium which prevails prior to the introduction of a budgetary change (e.g.,

<sup>1</sup> My attention was drawn to this quotation by Carl Shoup's unpublished manuscript, "Ricardo on Taxation," p. 1. See *Letters of David Ricardo to Hutches Trower and Others, 1811-1823*, edited by James Bonar and J. H. Hollander (Oxford, 1899), p. 93.

substitution of tax  $x$  for tax  $y$ ) with that which prevails after all adjustments to this change have been completed.

Note the term "all adjustments." There have been repeated and fruitless attempts, in the literature of public finance, to distinguish between various lines of adjustment, such as changes in the price of taxed articles versus other changes in income, expenditure, and so forth. Such distinctions are meaningless and untenable in the context of a general equilibrium analysis.<sup>2</sup> At the same time, it remains useful to distinguish between various aspects of the end result.

Ideally, we might wish to describe the real income change which results for each and every member of the community; but this is neither feasible nor necessary. Some over-all measures of the change are needed and as such I propose to consider the resulting change in the state of distribution and the resulting change in the level of output. The first, or change in distribution, I propose to refer to as incidence; the second, as output effects.

Incidence thus defined deals with the distribution of real rather than money income; that is to say, a person's income position may change either because of a change in his earnings, a change in his personal tax payments, or a change in the prices of the products which he buys. Also, I propose that change in distribution be defined as change in distribution by income brackets (change in the Lorenz curve) and not, as the classical economists choose to, as change in distribution by factor shares.

In a setting where a change in tax policy does not give rise to a change in total output, our concept of incidence is relatively simple. When one tax is substituted for another, some individuals will gain what others lose, and the resulting change in distribution is the measure of the difference in incidence. Or, in the case of an increase in budget, financed by a new tax, income available for private use will decline; the loss of income in turn will be equal to the tax yield, and its distribution will register the incidence of the tax and public expenditure. Some difficulties of definition arise even in this case but they may be disregarded here.

The case is more complex where there is a change in the level as well as in the distribution of real output. Now total losses and gains of income available for private use do not cancel when one tax is substituted for another; and losses do not add to the amount of yield in the case of a new tax. Indeed, cases may be constructed where a change in tax structure will result in a higher real income available for private

<sup>2</sup>Introducing time period analysis, we may determine the adjustments completed at some point of time prior to final equilibrium. But we must consider all the changes which have come about up to that point of time.

use, not only for those from whom the tax is removed, but also for those on whom the tax is imposed. Thus substitution of sales for an upper bracket income tax may (although hardly will) so increase investment and the rate of growth that  $n$  years from now the real income of low bracket consumers net of tax will be higher than it would have been had the old tax structure been maintained. Once changes in output are involved, nothing can be done about separating losses or gains due to changes in tax "as such" from other losses or gains due to resulting changes in the level of real output. All that we can do is to consider the end result and to register what has happened to the state of distribution at the changed level of real income and what has happened to the level of real income. The fact that the two parts of the end result—incidence and output effects—are expressed in separate measures does not, of course, mean that their values are independent. They both result in the course of one and the same adjustment process and are dependent on each other. In a sense we may speak of the incidence of effects (i.e., the difference in actual incidence from what it would have been had there been no effects) and the effects of incidence (i.e., the difference in actual effects from what they would have been had incidence been neutral).

*Absolute Versus Differential Incidence.* Next, it is important to define clearly just what change in budget policy it is that we wish to investigate. A variety of formulations may be chosen if followed through consistently.

In particular, these points must be decided upon: do we wish to study combined tax and expenditure incidence or do we wish to study tax incidence alone; do we wish to study partial incidence, applying to one particular tax or part of the rate structure only, or do we wish to study total incidence, including the entire tax bill; do we wish to study absolute incidence, in which case we trace the changes which result from "thinking away" a particular tax or adding a new one, or do we wish to follow Wicksell and study differential incidence, in which case we have the changes which result when one tax is substituted for another equal yield tax? All three questions may be applied to the problem of expenditure incidence as well as tax incidence. The term "expenditure incidence" as here used refers to the change in income available for private use which results from changes in the expenditure side of the budget. The distributional impact of consumer services provided by the government free of direct charges is a different matter, requiring separate analysis.

Let us assume that we are interested in tax rather than expenditure or budget incidence. Also, let us assume that we wish to study partial

rather than total incidence. This leaves the choice between an absolute or differential formulation.

It seems to me that it is preferable to formulate the incidence problem in differential rather than in absolute terms. To be sure, it is quite possible conceptually to pose the problem in absolute terms. We may assume that a given tax is introduced while public expenditures are held constant, or that a particular tax is removed while expenditures remain unchanged. As long as the tax is small, this mental experiment may be made without much difficulty. But if the tax is large, it will become apparent that a change in tax without a change in expenditure involves a change in deficit or in surplus. The result of the adjustment, therefore, will include the aggregate expenditure changes induced by the change in deficit or surplus. If to avoid this we consider a combined tax and expenditure change, our result will not be a measure of tax but of budget incidence.

This difficulty is avoided to some degree at least if we compare the state of distribution which prevails while tax  $x$  is in effect with that which comes about if an equal yield tax  $y$  is substituted for  $x$ . Moreover, the differential formulation seems to me a more realistic view of the tax problem. If certain expenditures are to be introduced, these may be financed either by credit or tax  $x$  or tax  $y$ . The problem is to compare the resulting states of distribution. If certain expenditures are to be cut, taxes may be left unchanged or tax  $x$  or tax  $y$  may be cut. In these as in other cases, the problem of tax policy is usually one of comparing the results of and choosing between alternative tax adjustments.

*Partial and General Equilibrium View.* Incidence theory, as developed by Smith and Ricardo, was largely in general equilibrium terms. Thereafter, increasing emphasis came to be placed on partial considerations. An adequate incidence theory, it is evident, requires both points of view. To illustrate, consider the case of the corporation income tax. Nothing can be said about its operation in a general equilibrium setting unless some assumption is made about the initial adjustment (or intent of adjustment) on the part of the firm that is taxed. Here as in other phases of economic analysis, neither micro- nor macroeconomics can stand by itself. The individual worker, consumer, or firm adjusts to changing data as provided by the market. These data in turn are the result of individual adjustments, and so forth. Moreover, the total result may well differ from the intent of the individual adjusting unit.

It is altogether necessary, therefore, to readapt incidence theory to a general equilibrium setting. But this is a tough undertaking. If the

classical model of factor share and income determination was unrealistic, at least it provided a formula capable of yielding specific results. Today, no such formula is available either for the determination of factor shares or the determination of income. The framework of marginal productivity and bargaining power leaves us with a set of possible solutions, and liquidity preference further complicates the aggregate income picture. The analysis of incidence, therefore, is much more complex than it might have appeared to Ricardo.

## II

To demonstrate the nature of incidence analysis in general equilibrium terms, let us consider the strategic case of a general excise tax. A similar analysis might be developed for other taxes on cost or for the corporation income tax to the extent that it is considered to be an element of cost.

*Views on Excise Incidence.* The traditional view on excise incidence, based largely on partial equilibrium considerations, has been that excises are added to price and are paid by the consumer. This theoretical proposition, combined with the empirical observation that consumption expenditures as a whole decline as a percentage of income when moving up the income scale, has led to the widely accepted conclusion that the incidence of excises is regressive. This reasoning, which has been applied in various empirical studies of incidence, including that of Dr. Tucker and our own,<sup>3</sup> has recently been challenged.

Professor Rolph, in an important and provocative paper, has recently restated and developed an earlier argument by Professor H. Gunnison Brown which proposes that a general excise tax is not added to price but is deducted from factor payments.<sup>4</sup> In the competitive case, at least, the seller cannot raise price. He can only cut output and leave the industry. But if the tax is general, there is no tax-free industry to which he can move. Instead, he will stay and reduce factor payments. But returns will tend to be reduced equally for all factors and in all employments. Hence the incidence of a general excise will be similar to that of a proportional income tax; and if this is the case for a general excise, it will tend to be the case for a partial excise as well. This, to be sure, is an undue condensation of a rather complex argument, but it states the general case as I understand it. Moreover, Professor Rolph is here to set us right.

<sup>3</sup> See "Distribution of Tax Payments by Income Groups: A Case Study for 1948," by R. A. Musgrave, J. J. Carroll, L. D. Cook, and L. Frane, *National Tax Journal*, March, 1952.

<sup>4</sup> See "A Proposed Revision of Excise Tax Theory," by Earl R. Rolph, *Journal of Political Economy*, April, 1952, pp. 102-117, and "The Incidence of a General Output or a General Sales Tax," by Harry Gunnison Brown, *Journal of Political Economy*, April, 1939, pp. 254-263.



I am now persuaded that the conclusions of the Brown-Rolph approach may well be correct under certain assumptions. But I continue to have certain difficulties with this approach. As I see it, the approach—which to some extent has been followed also by Professor Goode<sup>5</sup>—suffers from two defects. One defect is that the argument appears to lose sight of the distinction between consumers and savers—a distinction which is basic to at least the conventional reasoning leading to the conclusion of regressivity of excise incidence. Another defect is that the argument seems to involve a mix-up between the direction of initial price adjustment and the final incidence in terms of change in real income. Also, we must keep in mind explicitly just what monetary assumptions are involved. Let me try to reconsider the argument with these points in mind.

*Real Incidence of Excise on Consumer Good.* In order to simplify the problem, we postulate an economy in which there are two producers, A and B, and two goods  $x$  and  $y$ . We assume that A spends his entire income on the purchase of  $x$ , the consumer good, while B saves most of his income and applies his savings to the purchase of  $y$ , the capital good. Subject to later correction, both A and B may receive wage income, but all interest income accrues to B. To simplify, we assume further that  $y$ , the capital good, is produced instantaneously and involves labor input only, while  $x$ , the consumer good, is obtained through "ripening" of the capital good plus some further labor input or "value added."

Now let us assume that a proportional income tax on the income of A and B is replaced by an excise on  $x$ . We wish to determine what happens to the real income of A and B. For this purpose we must trace changes in the money income of A and B, and deflate these money incomes by the prices of  $x$  and  $y$ , respectively. (If we were to deflate the saver's income by the price of consumer goods, we would argue in effect that a tax on consumer goods imposes a burden on all holders of wealth, thus losing any correspondence between burden and yield. If subsequently the saver dissaves and turns consumer, he will then be charged with whichever tax addition to consumer prices holds at that time.) Or, if B spends part of his income on consumption, a weighted index is to be applied. The first step is to determine how the prices of  $x$  and  $y$  are related. The basic rule is that the market price (including tax) of the capital good must always be equal to the discounted value of the net price (excluding tax) of the consumer good after deducting value added.

Given this basic rule, we shall see presently that the resulting real incidence will be the same, whether the tax is added to price or de-

<sup>5</sup> See Richard Goode, *The Corporation Income Tax*, p. 59.

ducted from factor payments. For the time being, let us consider a "backward adjustment" and assume that the tax is deducted from factor payments. Thus the market price of  $x$  remains unchanged and the net price is reduced by the amount of tax. This reduction in the net price, as Professors Rolph and Brown have observed, may be passed on to any of the factors—in our case labor and waiting—that are involved.

Let us assume first that the rate of interest  $i$  is fixed. Our rule requires that the price of  $y$  should decline in response to the decline in the net price of  $x$ . As the cost of  $y$  declines, wage rates and wage incomes fall. Also, interest income in dollar terms falls, as the same  $i$  is applied to a lower value of  $y$ . Consider now the result of these adjustments. B will find himself relieved of the income tax. He will find that his money income (wages as well as interest) has declined but the price of  $y$  has fallen at the same rate. His real income is returned to the pre-income tax level and he is freed of any tax burden. While A finds himself relieved of the income tax, his wage income is reduced, and the price of  $x$  is unchanged.<sup>6</sup> His real income is reduced on balance, as he now bears the total burden of the tax. The tax in this case is borne by A, the consumer.

Now let us assume that the rate of interest changes while real wages in terms of  $x$  remain unchanged. As the price of  $x$  is constant, money wages will be constant, so that the price of  $y$  will be unchanged. But the net price of  $x$  has declined, so that the rule now requires a corresponding decline in  $i$ . We now obtain the opposite result. A finds himself relieved of the income tax, his wages and the price of  $x$  are unchanged, and his real income being returned to the pre-income tax position. B also finds himself relieved of the income tax and the price of  $y$  unchanged. But the interest component of his income has fallen, as a lower  $i$  applies to the same value of  $y$ . On balance, he now bears the entire burden of the tax. The tax in this case is borne by B, the saver.<sup>7</sup>

It follows that the incidence of the tax will be on A or on B, depending on whether the reduction in cost depresses the return to the one or the other factor.<sup>8</sup> The above illustrations, of course, are limiting cases,

\*To simplify, we disregard in the text argument the fact that the consumer good involves some value added. Because of this, the net price of  $x$  will fall to the extent that the reduction in wages reduces the cost of this value added. This, however, will not further affect the price of  $y$  as this price depends on the net price of  $x$  after deducting value added.

<sup>6</sup>A qualification similar to that of the preceding note should again be applied.

<sup>7</sup>The Editor has kindly permitted me to insert this correction, not included in the original paper.

The limiting cases considered in the text discussion do not provide a very useful setting in which to compare the incidence of various taxes. By assumption, the incidence of any tax must be on wage earners-consumers in the first and on interest recipients in the second case. The text argument of the two preceding paragraphs does not, in fact, deal with the

the more likely solution being a mixed case somewhere between these extremes. If we assume a classical model, where there is no liquidity preference, all we can say is that the allocation in cost reduction between the two factors will depend wholly upon their respective elasticities of supply and their respective productivity schedules. As far as the supply of savings is concerned, the assumption of infinite elasticity (which would place the entire burden on A) may be ruled out. More likely than not, saving will be rather inelastic with regard to interest. But the same might be said with regard to real wages, where the total supply of labor is concerned. Yet, in order to determine factor shares, one or the other (or both) schedule must be elastic, and the burden of the tax will be distributed accordingly.

If we allow for liquidity preference, another possibility arises. We may now introduce the assumption that  $i$  is held constant by a compensatory adjustment in monetary policy. Monetary policy in this case might provide for credit restriction so as to offset the reduction in  $i$  which otherwise would come about. In this case, the incidence of the tax will be on A, the consumer. (A similar conclusion is reached if we assume a situation where  $i$  has hit bottom, due to an infinitely elastic liquidity preference schedule.) This assumption, supported by prevailing rigidities in money wages, seems reasonably realistic. Moreover, it demonstrates the interesting—and all too neglected point—that measures of monetary policy involve problems in incidence just as do measures of tax policy.

*Real Incidence of Excise on Capital Good.* We now turn briefly to the adjustments which result if an excise on the capital good  $y$  is substituted for the general income tax. To simplify, let us now suppose that B has interest income only. A complication arises in this case if B is assumed to obtain both wage and interest income. While in the case of an excise on consumer goods wages and the price of  $y$  move together, we now find that the price of  $y$  rises relative to wages. As wages decline, B loses in terms of  $y$  on his wage income. In order to

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differential incidence of an income and a sales tax but more nearly describes the absolute incidence of a sales tax. Removal of the income tax does not, as assumed in the text, leave relative factor earnings unchanged; depending on the elasticity assumptions made, factor earnings will change as the income tax is removed. Introduction of the sales tax, in turn, will restore the relative income positions which prevailed under the income tax. Since the text argument assumes the effects of income tax removal to be distributionally neutral, the conclusions as to changes in relative positions are correct if taken to interpret the absolute incidence of a sales tax.

A more useful framework for determining the differential incidence of a proportional income and sales tax is provided by the assumption of inelastic factor supplies. Here it may be shown that substitution of a sales for an income tax will leave relative earnings unchanged but raise the prices of consumer goods relative to those of capital goods—a result which may be reasonably interpreted as placing the burden on the consumer. For a restatement of the entire problem, see my paper, "On Incidence," to be published in the *Journal of Political Economy* for August or October, 1953.

place the entire burden on him, a reduction in  $i$  and fall in the price of  $x$  will be needed.

Again we assume a case of backward adjustment; i.e., we hold the market price of  $y$  constant. Suppose first that  $i$  is constant. As the market price of  $y$  is constant, the net price of  $y$  is reduced. Money wages are reduced. Since  $i$  is constant and the market price of  $y$  is unchanged, the rule requires that the price of  $x$  remain unchanged. What are the results?  $B$  finds that he is relieved of the income tax. His interest income is unchanged and so is the price of  $y$ . Thus he is returned to the pretax position. The entire burden of the tax falls on  $A$  whose wages have declined while the price of  $x$  remained unchanged, except for a decline in the value added component.

Suppose now that real wages are constant in terms of  $x$ , the entire adjustment being in  $i$ . The net price of  $y$  again declines; hence money wages fall. Since real wages are to be unchanged in terms of  $x$ , the price of  $x$  must fall accordingly. As the market price of  $y$  is unchanged, this implies a fall in  $i$ .  $A$  now finds himself relieved of the income tax while his real wages are unchanged.  $B$  finds his interest income reduced while the price of  $y$  is unchanged. The tax, therefore, falls on  $B$ .

As before, the incidence of the tax may be on either the consumer or the saver, depending on the elasticities involved.<sup>9</sup> This is not to say that it is a matter of indifference whether the tax is imposed on  $x$  or on  $y$ . While we may make two sets of elasticity assumptions which will give the same result in both cases, the same set of assumptions will not. Whereas the tax on the consumer good is a general tax on cost which applies to both of our factors (labor and waiting) the tax on the capital good is discriminatory and will lend to substitution of labor for capital. Therefore it is likely that the burden will fall more heavily on  $B$ . The possibility of substitution, of course, assumes that  $x$  includes value added which may be increased as less capital is used. Note, also, that the entire analysis assumes an equilibrium where the supply of funds is scarce and demands a rate of interest. In the Schumpeterian equilibrium, it is obvious that the consumer must bear the tax.

*Direction of Adjustment.* So far we have discussed the adjustment to an excise on consumer and capital goods in terms of reduction in cost while the price of the taxed product was held constant. It must now be noted that the argument might have been presented as well in terms of an adjustment providing for a rise in the market price of the taxed commodity while factor payments are unchanged in money terms.

We return to the tax on  $x$  and the case of constant  $i$ . Let the market price of  $x$  increase by the amount of tax, so that the net price of  $x$  is

<sup>9</sup> An argument similar to that of note 8 above applies.

unchanged. Our rule now requires that the price of  $y$  and hence money wages be unchanged. B finds his money income (be it interest or wages) unchanged. He is relieved of the income tax, and as the price of  $y$  is unchanged, his real income is returned to the pre-income tax position. A also experiences a gain in disposable money income as the income tax is removed, but he finds this gain more than offset by a rise in the market price of  $x$ . As in our earlier case of backward adjustment, B is freed of any tax burden, the entire burden of the tax being now on A.

Now consider the case where real wages are unchanged. As the price of  $x$  has risen, money wages must rise, and this will increase the price of  $y$ . The price of  $x$  in this case rises both due to the addition of the tax and the increased cost of the value added component. But the net price of  $x$  is unchanged, so that the rule requires  $i$  to fall. In this case, A finds the income tax removed, while his wages and the price of  $x$  are increased. On balance, he will be returned to his pre-income tax position. As in the earlier case of backward adjustment, the entire burden of the tax is now on B, who finds the price of  $y$  increased without a compensating increase in his money income.

Our previous argument relating to the incidence of a tax on the capital good might be restated similarly in terms of backward adjustment. But this may be passed over here. In the absence of particular rigidities, the result in terms of real incidence is determined by the prevailing elasticities of supply and demand and not by the direction of the adjustment. But even though the direction is not a matter of great importance, it is of interest to inquire as to what is the most likely course of development.

In the classical model, a rather definite statement can be made. As there exists no liquidity preference, all money is transaction money and total payments are determined by the product of transaction velocity and the stock of money. It follows that there is always only one feasible adjustment; i.e., that which results in the proper volume of total payments. If we assume that all payments—public and private—involve the same claim on transaction money, it is evident that total payments must remain constant. (Alternatively, it might be assumed that tax and/or public purchase payments exert a lesser claim than do wages or private purchase payments, that the structure of “overlaps” is changed, and so forth.) From this, certain conclusions may be drawn regarding the direction of adjustment for various types of tax. To illustrate, let us assume an economy where only consumer goods are produced. We may conclude that introduction of an income tax-financed budget into the economy will reduce wages, prices and the money value of the GNP, at least in the absence of source withholding. Also, we may conclude that introduction of a sales tax-financed budget will



raise prices to private buyers and lower prices to the government (while leaving wages unchanged) if government purchases are not subject to tax, but leave prices unaffected (and reduce wages) if government purchases are subject to tax.

Once liquidity preference is allowed for, the direction of adjustment becomes less evident. The system may now provide the additional transaction money required in the case of forward adjustment, either by draft on idle balances or on the slack in the credit system. In other instances, transaction money which is released may be added to idle balances. Professor Rolph's observation that individual firms cannot increase price under pure competition still holds. But pure competition is the exception, while administered prices are more nearly the rule. This being the case, it is altogether possible that an excise tax will give rise to a forward adjustment; indeed, it is my feeling that this is what will happen in the typical case. (The proposition that excises are added to price does not mean, of course, that it is impossible to check inflation by the use of excises. It merely means that the price level at which inflation is checked will be higher than it would be if the tax were not added to price.) If such forward adjustment occurs, and assuming the total money supply unchanged, certain consequences may result. Changes in the need for transaction money may change the supply of asset money and thence interest and investment; or the Pigou effect may come into play. But considering the likely range of resulting price level changes, I suspect that these are points of minor importance. As I see it, they do not disqualify our earlier conclusion that the direction of adjustment is by no means the crux of the matter.

### III

The preceding argument involves many simplifying assumptions, at least some of which should be noted briefly.

*Wage Differentials.* In the above model, we have dealt only with two types of factor earnings. In particular, all labor has been assumed of the same type. In a more realistic setting, tax adjustments will lead to changes in demand, and these will give rise to a change in product mix. As different factors or types of labor have a comparative advantage in specific lines of production, this will give rise to further changes in relative wage rates and earnings.

Such changes undoubtedly may be of great importance for any particular individual, but I doubt whether they will be of great importance to an over-all analysis of incidence, involving millions of taxpayers. This conclusion is based on the empirical hypothesis—which seems reasonable to me as a first approximation—that earnings from various industries are distributed similarly by income brackets (ac-

ording to the same Lorenz curve). To the extent that this is the case, changes in wage income due to changes in product mix will not affect the state of distribution and hence incidence as here defined. I do not mean to say that changes in relative earnings will be distributionally neutral in all cases. Suppose, for instance, that the profit-to-wage ratio is higher in the capital than in the consumer goods industry. Then a shift in the product mix from  $y$  to  $x$  will tend to shift income toward the lower brackets. However, deviations from our hypothesis are just as apt to increase as to reduce the dissimilarity in the incidence of an excise and a proportional income tax. It is this hypothesis—variations of which apply to other aspects of the problem—which permits us to obtain conclusions on incidence as here defined, without having to trace and impute to income brackets all changes in relative wages throughout the system. Reference is to further complications which arise if we allow for elastic demand so that both A and B purchase both  $x$  and  $y$ , variable costs, or varying degrees of capital intensity in the production of various consumer goods.

*Growth Effects.* Also, no mention has been made so far of changes in the level of real output which may result from tax adjustments. Such changes are bound to occur whenever there is a change in product mix between capital and consumer goods. Consider, for instance, the substitution of an excise on consumer goods for a general income tax. As a result, more capital and less consumer goods are produced. This in turn means that the level of total real output at some future time will be higher (such will be the case this side of the stationary state, at least) and that it may be distributed differently.

In the first case, we are dealing with an output effect superimposed on incidence; as noted before, separate measures can be applied to the two aspects of the end result, but neither phase of the adjustment process can be separated from the other. In the second case, it is not easy to say on a priori grounds just what will be the resulting change in distribution. To be sure, the total capital stock on which capital earnings are obtained will increase, and it may be assumed that capital earnings will accrue more largely to the upper income groups. But as the capital stock is increased, yields may decline and wage rates rise as labor now becomes the scarcer factor.

There is no reason to assume, therefore, that capital income as a share in total income must increase. Pending a better insight into the dynamics of distribution theory, I should prefer to assume that the incidence of the growth in income is distributionally neutral.

*Employment Effects.* It remains to note changes in aggregate expenditure which may result from changes in tax policy and which have been considered so far.

Substitution of an excise for a progressive income tax, for instance, may reduce the community's propensity to consume net of tax and/or increase investment incentives. Either effect may outweigh the other, or they may cancel. If a change in aggregate expenditures occurs, the result (depending on the prevailing state of employment) may be a price level change and/or a change in output and employment. Both will have a bearing on incidence and qualify our earlier conclusions.

Professor Richard Goode, in his splendid study on *The Corporation Income Tax*, correctly holds (see page 58) that general changes of this kind cannot be ignored when dealing with a tax of broad coverage, such as a general corporation income or a sales tax. Although the scope of these aggregate expenditure effects is reduced if we consider differential rather than absolute incidence, such effects may remain a major factor even in the economy's adjustment to a substitution of equal yield taxes. Thus we may construct models of income determination to show what aggregate expenditure effects may follow from various tax substitutions, and we may introduce hypotheses as to what happens to the bracket distribution of income as a result. But I am not happy with this solution, as it leads us away from the pure problem of incidence which, as an issue in distribution, deals with the allocation of resource claims within a given income total.

There is no simple way out of this dilemma. It is of the essence, from the point of view of fiscal policy analysis, to allow for changes in aggregate expenditure. Yet it is of the essence of the incidence problem to deal with changes in the distribution of a given income total. In the theoretical model of public economy these objectives may be reconciled; we may assume a perfect budget policy, where adjusting the distribution of income available for private use is one function and the control over aggregate expenditures is another, both to be planned in a comprehensive and interdependent revenue-expenditure system. But, useful though this may be for purposes of normative theory, it provides no working hypothesis for the handling of a historical incidence study.

It remains necessary then to consider aggregate expenditure effects which result from particular tax policies. And if this is done, we may obtain results which diverge from those of Section II. Short of special reasons to the contrary, however, I would accept the conclusions on incidence arrived at on the basis of the Section II type of reasoning. Even without the complication of aggregate expenditure change, the problem is sufficiently difficult and would, I fear, have dismayed the high hopes of Ricardo. Yet I too am dismayed by the thought that our knowledge of the science be so imperfect as to have us plead a general diffusion theory by default. This would afford all too convenient an approach to tax policy.

Our excise on consumer goods is a good case in point. The preceding argument, as that of Professor Rolph, shows that such excises may be distributed according to different patterns—regressive, proportional, or possible progressive—depending on all the circumstances involved. To reach a specific conclusion, empirical observation and monetary policy assumptions must be added to the theoretical framework. But if this is done, I should think that the traditional conclusion is fairly correct, even though the traditional reasoning may have been faulty.

## THE DISTRIBUTION OF GOVERNMENT BURDENS AND BENEFITS

By RUFUS S. TUCKER  
*General Motors Corporation*

Economists and statisticians are pretty well agreed that since 1929 there has been a considerable redistribution of income in this country, in the direction of greater equality. My estimate of the extent of this redistribution is shown on Chart I, in the form of Lorenz curves for the respective years. The figures are given in Table 1 in the columns headed A. Many economists attribute this development largely to the tax system, which has become increasingly progressive (if I may use a word with so many overtones). This explanation may be too simple. I published some years ago a study based on income tax statistics<sup>1</sup> indicating a strong probability that the movement toward equality had been going on ever since the Civil War, while our tax system was only slightly if at all progressive, and taxes were much smaller in relation to the national income. Income appears to have been more concentrated in 1863-66, 1868-70, 1894, 1915-17, and 1927-28 than in 1929. It was certainly more concentrated in 1929 than in any subsequent year. The greatest change came between 1929 and 1935 and appears to have been more a result of business depression than of fiscal policy.

A progressive tax system, no matter how high the rate of progression, would not bring about a redistribution of income if the proceeds of taxes were spent in such a way as to increase the income or reduce the expenditures of the taxpayers in the same proportion as the taxes they paid. Also, a proportional tax system might accompany and facilitate a redistribution of income if the government's expenditures were large and so directed as to increase the income or reduce the expenditures of nontaxpayers or small taxpayers. Consequently an adequate analysis of the situation requires consideration of the distribution of government benefits as well as taxes.

### *The Distribution of Taxes*

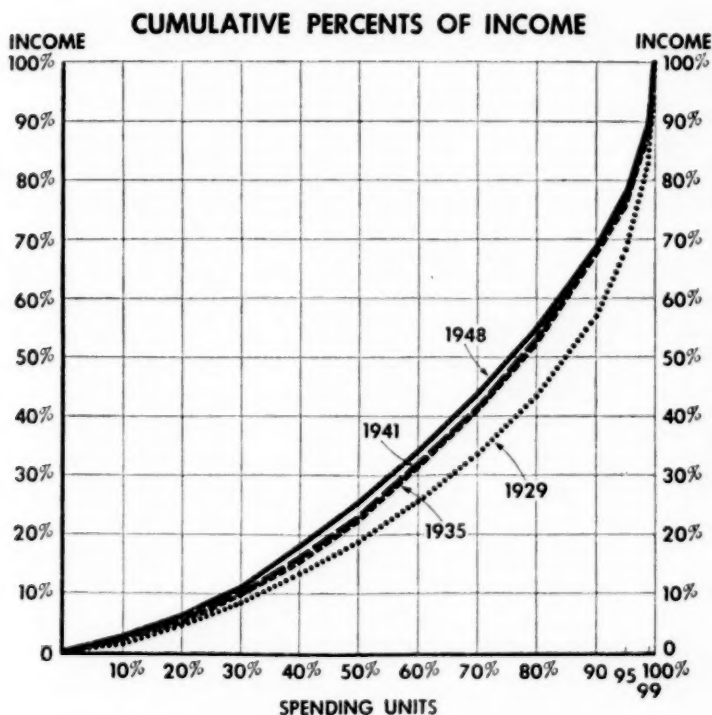
As some of you are aware, Professor Musgrave and I recently published somewhat divergent analyses of the distribution of taxes in

<sup>1</sup> "The Distribution of Income among Income Taxpayers in the United States, 1863-1935," *Quarterly Journal of Economics*, August, 1938.



1948.<sup>2</sup> As the result of some mutually profitable discussion, we now agree fairly closely on the amount of tax paid by income classes above \$1,000 and on the ratios of taxes to the total of money and nonmoney income of money-income classes between \$1,000 and \$7,500. These classes included some 83 per cent of all consumer units and some 85 per cent of all persons in the noninstitutional population. Our remaining differences derive either from different estimates of the nonmoney

### DISTRIBUTION OF MONEY PLUS NON-MONEY INCOME BY SPENDING UNITS



income of persons with small money incomes, or from different opinions concerning the treatment of undistributed corporation income.

I have used the same methods, as far as the available statistics will

<sup>2</sup> R. A. Musgrave, "Distribution of Tax Payments by Income Groups: A Case Study for 1948," *National Tax Journal*, March, 1951; R. S. Tucker, "Distribution of Tax Burdens in 1948," *ibid.*, September, 1951; R. S. Musgrave, "Rejoinder to Dr. Tucker," and R. S. Tucker, "Rebuttal," *ibid.*, March, 1952. See, also, *ibid.*, March, 1953.

TABLE 1  
DISTRIBUTION OF INCOME, TAX BURDENS, AND GOVERNMENT BENEFITS  
(percentages in each decile of spending units)

Deciles	1929				1935				1941				1948			
	In- come		Tax		Benefits		In- come	Tax	Benefits		In- come	Tax	Benefits			
	A		B		C				D				A		B	
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
I	1.4	1.1	7.7	2.2	2.1	1.8	7.8	5.1	2.1	1.6	6.6	3.3	2.3	1.4	7.0	3.9
II	3.2	2.5	8.4	4.0	3.1	2.3	8.2	5.4	3.5	2.2	8.0	4.5	3.9	2.1	8.2	5.1
III	3.8	2.9	8.5	4.3	4.5	3.7	9.0	7.4	4.4	3.0	8.6	5.4	4.8	3.1	8.6	5.5
IV	5.0	3.9	8.6	5.0	5.6	4.4	9.1	7.8	5.8	3.4	8.7	6.1	7.0	5.1	9.5	6.8
V	5.4	4.3	8.6	5.8	7.0	5.8	9.2	8.1	7.0	5.0	8.8	6.3	7.4	6.1	10.1	7.7
VI	6.7	5.0	8.7	7.0	9.1	6.8	9.3	8.5	8.7	8.0	9.8	7.9	8.7	7.0	10.3	8.4
VII	8.0	6.6	9.0	7.8	9.5	7.9	9.4	8.9	9.5	8.8	10.2	8.4	9.6	7.2	10.4	8.9
VIII	10.0	8.5	9.2	8.9	11.3	9.9	9.6	10.0	12.0	10.1	10.6	10.4	11.3	10.0	10.7	9.7
IX	13.5	11.0	9.7	11.2	15.2	12.3	9.9	11.8	15.5	12.1	11.7	13.1	13.7	12.7	11.0	12.6
X	43.0	54.2	21.6	43.8	32.6	45.1	18.5	27.0	31.5	45.8	17.0	34.6	31.3	45.3	14.2	31.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Percentiles

Percentiles	Detail of Xth Decile															
	Amount of Income (money and nonmoney) (\$'000,000)		87,687		63,051		95,308		209,494							
	Amount of Tax (\$'000,000)		10,350		11,191		24,119		57,391							
	91-95	96-99	100	11.1	9.5	5.9	8.2	8.4	8.1	5.5	7.3	8.8	8.0	6.0	7.2	7.8
	14.7	14.1	7.8	12.5	14.1	7.8	12.5	12.4	14.7	6.4	9.3	11.9	13.8	6.9	10.6	12.7
	17.2	30.6	7.9	23.1	30.6	7.9	23.1	11.8	22.3	6.6	10.4	10.8	24.0	4.1	16.8	10.9
Amount of Income (money and nonmoney) (\$'000,000)					87,687				63,051				95,308			
Amount of Tax (\$'000,000)					10,350				11,191				24,119			

**NOTE:** In column C nonallocable benefits are distributed per capita; in column D they are distributed by ownership of property.

permit, to work out the distribution of taxes by income classes and the ratio of taxes to total money and nonmoney income in 1929, 1935, and 1941. In order to facilitate comparisons and overcome to some extent the misleading effects of differences in definition of income and in the purchasing power of money, all tables and charts have been based on deciles and percentiles instead of money income. This means only that all of the spending units (families and independent individuals) have been arranged according to the amount of their incomes (including nonmoney incomes) and the appropriate calculations made for each tenth. The top tenth has been broken down to show the top percentile and the next four and next five percentiles.

The sources of my material for the distribution of income and consumption were the Brookings study for 1929 (*America's Capacity to Consume*, 1934), the National Resources Committee studies,<sup>3</sup> the *Study of Consumer Purchases for 1935* by the Bureau of Home Economics and the Bureau of Labor Statistics, and the Bureau of Labor Statistics and Department of Agriculture studies for 1941, supplemented by the income tax statistics for those years.

The Brookings material had to be adjusted to eliminate capital gains and losses from income, and to include nonmoney income of unattached individuals and nonfarm families. The National Resources Committee material had to be adjusted for nonmoney income of unattached individuals and in several other ways to conform to the results of the *Study of Consumer Purchases* and the income tax statistics.<sup>4</sup>

Assumptions as to the incidence of taxes were the same as described in my 1948 study: personal income taxes were attributed to the persons paying them; corporation income taxes one-half to consumers and one-half to stockholders; excises and customs to consumers; taxes on urban owned homes and one-half of the taxes on farm property to the homeowners and farmers; the other half of taxes on farm property and all other property taxes were distributed between owners, tenants, and consumers as nearly as possible according to the method described in my September, 1951, article in the *National Tax Journal*, although the absence of statistics sometimes compelled a cruder breakdown. In cases where a tax was attributed to a certain income and the definition of income in the source used did not include an allowance for that tax, an amount of income equal to the tax was "imputed" and added to the

<sup>3</sup> *Consumer Income in the United States* (August, 1938), *Consumer Expenditures in the United States* (March, 1939), *Family Expenditures in the United States* (June, 1941) (National Resources Committee).

<sup>4</sup> For details see R. S. Tucker, "The National Resources Committee's Report on Distribution of Income," *Review of Economic Statistics*, November, 1940, and "Distribution of Income in 1935-36," *Journal of the American Statistical Association*, December, 1942, pp. 489-495.

recorded money and nonmoney income in order to get the ratio of tax to income. The principal item of imputed income was the corporation income tax, one-half of which was imputed to stockholders. Another item was one-half of the property tax on farms. The amounts of the various taxes were taken from the Department of Commerce compilations of national income (*National Income*, 1951 edition, Table 8), but the excises were broken down with the aid of the *Statistical Abstract*, and state and local property taxes were divided into taxes on farms, businesses, and homes, and on personal and real property, in the proportions used by Professor Musgrave and Dr. Colm in their studies for 1948 and 1938.

The results of these analyses are shown on Charts II and III. The figures are in Table 2 and in the columns headed B in Table 1. Details are inexact because in every stage of the analysis it was necessary to use a good deal of personal judgment. Moreover, the estimates of in-

## DISTRIBUTION OF ALL TAXES BY SPENDING UNITS

### CUMULATIVE PERCENTS OF TAXES

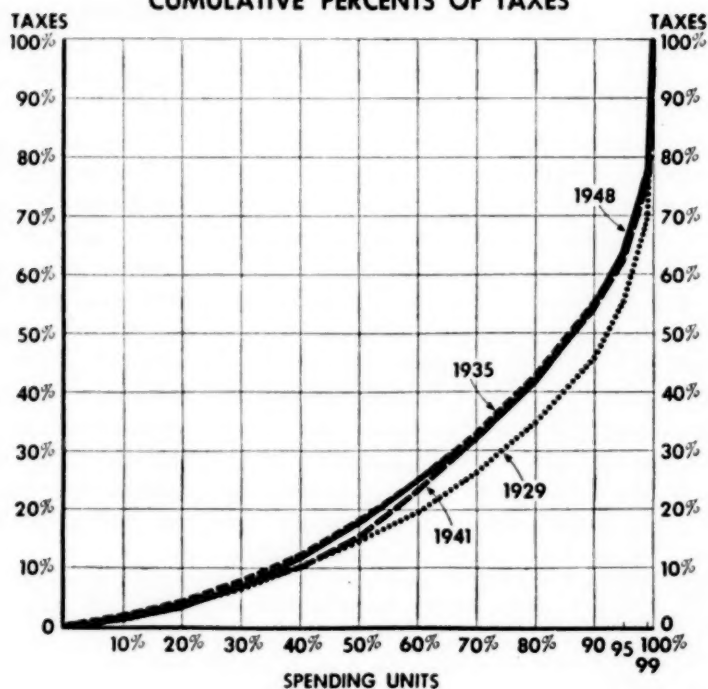


CHART II

come and consumption in the sources used were not necessarily accurate, as I am sure their authors would admit. But I am confident that these tables and charts are close enough to the truth to warrant the following conclusions:

1. The tax system of this country became increasingly progressive, measured against income, between 1929 and 1948, while the distribution of income was becoming more equal.

2. In 1929, progression became noticeable in the sixth decile (above \$1,560); in 1935 only in the ninth (above \$2,060); in 1941 in the third (above \$870); in 1948 in the second (above \$1,180).

TABLE 2  
RATIO OF ALL TAXES TO TOTAL AND IMPUTED INCOME

Deciles of Spending Units	1929	1935	1941	1948
	%	%	%	%
I	8.6	15.1	18.3	16.8
II	8.7	14.6	17.9	17.1
III	8.7	14.0	18.5	19.0
IV	8.8	14.0	19.7	21.0
V	8.9	14.7	20.9	22.0
VI	9.0	14.8	21.4	22.4
VII	9.2	14.9	21.9	22.9
VIII	9.4	15.0	22.6	24.0
IX	9.5	15.2	22.8	25.1
X	14.1	23.6	33.1	42.7
All Classes	11.8	17.7	25.3	27.4

Detail of Xth Decile				
Percentile				
91-95	9.8	15.9	23.0	25.8
96-99	10.6	17.9	26.4	30.2
100	18.2	32.9	47.3	51.1
Incomes over \$1,000,000	31.0	65.0	86.0	88.0

3. In 1929, only the top one-hundredth (above \$19,600) paid taxes at a higher rate than the over-all average; in 1935 the top three-hundredths (above \$4,470); in 1941, the top four-hundredths (above \$5,610); and in 1948 the top five-hundredths (above \$8,600).

4. The burden of taxation on the lowest tenth of the taxpayers doubled between 1929 and 1948, and the burden on the top one-hundredth tripled, while the average for all classes increased about 134 per cent.

5. The rate of tax paid by the top one-hundredth in 1929 was twice as high as the rate paid by the lowest tenth; in 1948 it was three times



### RATIO OF ALL TAXES TO TOTAL AND IMPUTED INCOME

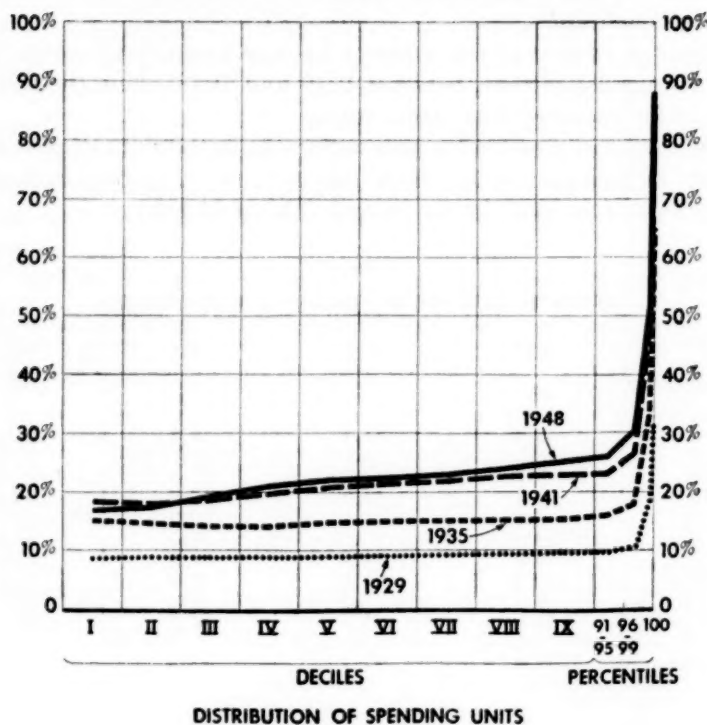


CHART III

as high. This is assuming that one-half the tax on corporation income is included in both the stockholders' incomes and their taxes.

6. The total of personal income, according to the Department of Commerce, rose 146 per cent from 1929 to 1948; in constant dollars the rise was 76 per cent; in constant dollars per spending unit it was 47 per cent.

7. Nevertheless, the income of the top percentile remained almost unchanged in constant dollars and the average income per spending unit in that percentile fell 15 per cent, before deduction of taxes.

8. Disposable income, i.e., personal incomes less income taxes and some other personal taxes, rose 128 per cent; in constant dollars it rose 63 per cent; disposable income in constant dollars per spending unit rose 36 per cent.

9. Nevertheless, income less income tax of the top percentile fell

20 per cent in constant dollars; it fell 34 per cent in constant dollars per spending unit.

10. The average income remaining to the top 20 per cent of spending units, after payment of income taxes, was 10 per cent less in 1948 than in 1929 if measured in dollars of constant purchasing power. This top 20 per cent included in 1948 all spending units with incomes over \$5,200; in 1929 it included all over \$2,850.

### *The Distribution of Government Benefits*

Little of a statistical nature has been published concerning the distribution of the benefits of government expenditures.<sup>5</sup> Of course this is a hard subject to treat statistically, partly because of the inadequacy of statistical material but more because of differences of opinion concerning the nature and proper purposes of government, the extent to which government expenditures accomplish those purposes, and the difficulty, if not impossibility, of comparing imponderables. Nevertheless, some broad conclusions are possible, and in any case an attempt to reduce these problems to a quantitative base may help in analyzing them and in delimiting the areas of difference.

What are the objectives of organized government? According to Locke they were the protection of life, liberty, and property. This phrasing was also used in the Fifth Amendment of our Constitution. Jefferson substituted "the pursuit of happiness" for "property," but unless he meant the pursuit of gain his phrase is merely a specification of the concept of liberty; and many philosophers have maintained that liberty is not possible without property. Smith stated that "the expense of government to the individuals of a great nation is like the expense of management to the joint tenants of a great estate, who are all obliged to contribute in proportion to their respective interests in the estate" and implied that their share of the benefits could be measured by "the revenue which they respectively enjoy under the protection of the state," which in turn appeared to him to be the definition of ability to pay.

How are we to measure the government's services in the distribution of life and liberty? Perhaps each man's life is of infinite value to him. In that case no statistical distribution of the benefits of government is possible; infinities are incomparable and fractions of infinities do not exist. Perhaps the value of life is finite and equal for each person. In that case the distribution of the value of protection of life can be calculated by income classes, and in 1948 was roughly as shown in line 2 of Table 3, in which the total population is distributed accord-

<sup>5</sup> But see J. H. Adler in K. E. Poole, *Fiscal Policies and the American Economy* (New York, 1951), pp. 359-421.

TABLE 3  
BASIS FOR ALLOCATION OF GOVERNMENT BENEFITS, 1948  
(Percentage Distribution by Income Classes)

Money Income Classes	0-1	1-2	2-3	3-4	4-5	5-7.5	7.5-10	10+
1. Spending units	12.2	17.7	22.9	20.1	11.6	10.2	2.4	2.9
2. Population	9.4	15.4	22.0	22.4	13.6	11.1	2.7	3.4
3. Life expectancy	8.4	15.4	22.8	22.9	13.7	11.1	2.6	3.1
4. Money income	2.0	7.6	16.1	19.5	14.5	17.3	5.5	17.5
5. Total income	2.8	8.1	16.3	19.3	14.3	16.9	5.4	16.9
6. Money expenditures for consumption	3.9	9.3	18.0	20.3	14.4	16.6	5.0	12.5
7. Total consumption	4.6	9.7	18.0	20.0	14.2	16.3	4.9	12.3
8. Ownership of "capital"	1.8	5.6	13.9	17.2	11.3	18.2	7.7	24.3
9. Interest on public debt	3.3	6.2	13.6	15.1	11.8	18.0	7.7	24.3
10. Distribution of OASB	27.4	20.3	15.2	15.8	9.1	8.1	1.9	2.2
11. Distribution of RR retirement	11.8	17.6	29.6	8.5	11.8	13.8	3.4	3.5
12. Federal civilian pensions	2.0	7.6	34.3	23.1	13.3	15.0	3.7	1.0
13. Unemployment insurance	16.9	23.9	20.3	14.2	10.9	9.6	2.4	1.8
14. RR unemployment benefits	17.8	21.3	28.3	7.9	10.9	9.6	2.4	1.8
15. Government insurance	7.6	13.3	27.4	24.3	14.0	6.6	2.1	4.7
16. Military pensions, disability, and retirement pay	7.1	12.7	21.2	30.9	17.3	4.7	2.7	4.4
17. Adjusted compensation, etc.	9.2	16.4	31.3	22.9	13.2	4.5	1.5	1.0
18. "Other" transfer payments	9.2	16.4	31.3	22.8	13.2	4.6	1.5	1.0
19. Department of Agriculture	5.2	11.1	15.3	11.6	10.1	23.9	6.0	16.8
20. Department of Labor	1.0	7.2	21.5	27.1	17.9	15.8	4.3	5.2
21. Department of Commerce	2.2	6.6	13.5	16.2	12.3	15.7	5.2	28.3
22. Education	9.6	15.0	22.6	22.0	12.8	12.1	3.2	2.7
23. Public housing	4.9	14.6	24.0	25.7	14.8	10.9	2.7	2.4
24. Highway expense, federal	3.2	8.1	15.1	20.2	15.4	17.7	7.7	12.6
25. State and local pensions	2.0	7.6	48.2	22.3	12.8	5.1	1.2	0.8
26. Direct relief	27.4	51.4	12.9	6.5	1.7	0.1	—	—
27. Highway expense, state and local	2.8	8.1	15.5	20.2	14.4	16.8	5.3	16.9

ing to the money income of the spending unit to which each person belongs. But the preservation of an old man's life does not generally amount to as much as that of a young man's, since the chances are he will die sooner anyway. If we distribute the population by age and by the income class of the family unit whose income they share, we can figure out very roughly the distribution of life expectancies. This is shown in line 3 of Table 3.

But there are several other logical ways to measure the value of the government's services in protecting life. We might guess the relative ability of each person to protect himself in the absence of government and credit the government with the difference between that and the kind of protection he gets in modern society. Or we might assume that the value of each man's life is measured by his income or his consumption of goods and services. Here again there are difficulties. Can any year be taken by itself? Or must we consider the total income or total

consumption of a lifetime? And if the latter, how can we place an individual within an income class? Nearly everyone goes up and down the scale during his life. Consumption in any given year is determined, not only by the income of that year, but by the incomes of previous years and the anticipated incomes of future years, since it can be partly paid for out of savings from previous incomes or out of borrowings against future incomes. Moreover, the reason for acquiring income is to facilitate consumption now or later. It is only as a man consumes that he really enjoys his income, unless he is a pathological miser or is so fond of his heirs that he enjoys the prospect of their consumption as fully as he does the actuality of his own. Recognizing the unsatisfactory nature of the figures, I present lines 4 and 5 of Table 3 to indicate roughly the distribution of income in 1948 and lines 6 and 7 to indicate the distribution of consumption.

Enough has been said to indicate the impossibility of getting a universally satisfactory answer to the problem of assigning values to the services of the government in the protection of life. The case of liberty is just as bad, or worse, since some of the activities of government consist in restricting liberties. But significant results can be attained in measuring the annual benefits of government to property owners and income receivers; and some of the specific activities of government can be charged to specific groups of citizens.

The distribution of property, i.e., all kinds of property, probably does not differ greatly from the distribution of total income. This assertion may be surprising to some economists, since it is generally accepted that the ownership of stocks, bonds, insurance policies, rentable real estate, bank accounts and other liquid assets is more concentrated among upper income groups than is either total or money income.

On the other hand, the ownership of consumers' durable goods does not appear to be concentrated more than income, and the ownership of consumers' nondurable goods and semidurable goods, such as clothing and minor household goods and workmen's tools, is almost certainly less concentrated. There is even some doubt about owners' equities in their houses, and net worth in general, since spending units with incomes over \$2,000 are more likely to have debts than those with smaller incomes, and homeowners with incomes over \$2,000 are more likely to have mortgages.

The best single statistical series available to represent the ownership of property yielding money income appears to be the S.R.C. tabulation of holdings of liquid assets (i.e., government bonds and checking and savings accounts in banks and postal savings and shares in savings and loan associations). Another fairly good series is the S.R.C. tabulation of holdings of total assets in excess of \$500. I have combined

these two to obtain the distribution shown in line 8 of Table 3. This distribution in my opinion exaggerates the concentration of property ownership in the broad sense but represents fairly well the distribution of what is generally considered capital. Incidentally, this table is based on money income classes, since that is the way the source statistics were presented, whereas the final results of my calculations, as shown in Table 1, are arranged by deciles.

A complete analysis of the distribution of government benefits would have to allow for the fact that many government activities and expenditures are wasteful and some are positively injurious to the nation as a whole. Even an ardent Democrat would admit the possibility of a few thousands of dollars of waste or graft; an efficiency expert would state the amount in billions; and the follower of Jefferson's doctrine that the best government is the one that governs least would easily find a large proportion of government activities that are positively harmful in their net effects on the nation's material and spiritual welfare. But in this analysis I shall assume that every dollar spent by the government represents a dollar's worth of benefit to someone and overlook the harm it may do to others.

If we assume that the general activities of government are intended to protect the income or property of citizens, does it follow that those benefits are proportional to incomes or property? Does a citizen whose income is \$50,000 get ten times as much benefit from the government as the citizen whose income is \$5,000? A common argument in favor of progressive taxation is that the marginal value of a large income is less than that of a small one; a wealthy man is supposed to suffer less than a poor man from the loss of 10 per cent of his income. By the same argument he benefits less from a government activity that raises his income or reduces his expenses 10 per cent. If there is enough in the theory of diminishing marginal utility of income to justify progressive tax rates, it follows that the general benefits of government are not proportional to income but regressive against income. A proportional tax on income might be regressive if measured against the psychological pains of the taxpayers; but government benefits proportional to income are also regressive if measured against the psychological pleasures of the beneficiaries.

In practice we have a tax system that is progressive against income. In the following pages I shall demonstrate that our government benefits are distributed regressively against income. Consequently, even without the concept of diminishing marginal utility the distribution of burdens does not correspond to the distribution of benefits. Perhaps it should not; perhaps it is proper for citizens with incomes over \$5,000



to be taxed for the benefit of those with smaller incomes, at least in moderation and for some specific purposes.

Many citizens would not gag at the Marxist doctrine, "From each according to his ability; to each according to his need," if need were closely defined. But if need comes to mean desire backed by political pressure and especially if administrators come to believe that spending is the way to prosperity as well as to re-election, a dangerous situation arises. Beyond some point the loss to the community as a whole will outweigh the benefits to the apparent beneficiaries of this system. Heavy taxes reduce investment and incentive and thereby slow down the growth of the national income and the opportunities for useful employment. They may reduce, also, the demand for the higher grades of artists, teachers, writers, actors, musicians, and skilled craftsmen of all sorts whose services have always been demanded by a few wealthy patrons and whose merits have been overlooked by the multitude. The result may well be slower material progress, or retrogression, increasing cultural drabness and monotony, a declining average of intelligence and character, etc. Let the reader take it up from there and for a historical example of the process study the decline of the Roman Empire.

Of course a large part of governmental expenditures are based on contractual obligations. The recipient may not be contributing anything to the national income in the current year, but in some previous year he made contributions—loans, insurance premiums, payments to retirement funds, or other deferments of income—for which he is now receiving repayment. But there is a gradation from benefits fully paid for, through benefits partly paid for, to benefits that are merely rationalized subsidies and finally to benefits that are purely gratuitous, whether or not their proponents attempt to justify them on ethical grounds. And in all four cases the funds for current payment come out of the current taxpayers' incomes and flow to the citizens in proportions that differ considerably from their current contributions.

The amount of government expenditures in 1948 of which the benefits are not allocable to specific groups of citizens, either because of conflicting theories or deficient statistics, was 30,208 million dollars, of which 19,599 millions were dispensed by the federal government and 10,609 millions by states and localities. Their distribution by income classes has been calculated on four assumptions: that they were equal for each person; that they were proportional to total income or ownership of property; that they were proportional to total consumption; and that they were proportional to the ownership of "capital" or income-producing property. The series used for each of these assump-

tions are shown in lines 3, 5, 7, and 8, respectively, of Table 3.

Since the first of these assumptions allocates the maximum benefits to the lowest group of income receivers and the fourth allocates the maximum to the highest group, only these two have been used in the building up of benefits by deciles as shown in Table 1, where they are respectively labeled C and D.

Expenditures amounting to 13,903 million dollars, federal, and 7,463 millions, state and local, were of such a sort that their distribution did not seem to be closely in accordance with either the total income of all citizens or their consumption expenditures or their property or their numbers; and other measures of distribution were available that seemed to be more appropriate. I will take up the important categories, one by one, with an explanation of how their benefits appear to have been distributed among the various income classes.

The first of these was interest on the public debt, amounting to 4,451 million dollars. Some 5 per cent of this interest was received by non-financial corporations and was allocated to stockholders in proportion to their dividends. Some 15 per cent was received by insurance companies and was allocated to insurance policyholders in proportion to their premiums. The remaining 80 per cent was received by banks or by individuals and was allocated according to the distribution of liquid assets reported by the Michigan Research Center's survey for 1948. Liquid assets in this survey consisted of government bonds and bank deposits.

It appears that the distribution of interest on the public debt was somewhat more concentrated in the income brackets above \$4,000 than total income or consumption but less concentrated than taxes, except in the income brackets between \$5,000 and \$10,000. However, the bracket under \$1,000 received a higher share of this interest than it did of total income. If my calculations are correct, no other group of government expenditures shows as large a share of benefits going to any income bracket above \$7,500 as its share of the tax burden.

Social insurance benefits are not paid strictly in proportion to the amounts contributed by covered workers. On the other hand, they are not paid as a uniform amount to each beneficiary. Consequently, they should be apportioned in part according to the number of beneficiaries and the rest according to their assumed contributions, which were partly based on their incomes while they were contributing. Both of these bases of distribution are uncertain, but we may certainly assume that the beneficiaries of social security were poorer on the whole after the retirement or death of their principal earner than they were while he was working. Those who received old age and survivors' benefits or other forms of retirement insurance may also be assumed to be no

more prosperous than other persons aged sixty-five or more or other insured persons. They also probably included a smaller proportion with incomes over \$4,000 than other retired persons. Pensioners are certainly poorer as a rule than active workers in their previous occupations. On the other hand, they are probably better off than those who are involuntarily retired without pensions, and a large proportion of the retired persons with incomes under \$4,000 are involuntarily retired.

In the light of these general principles, I have distributed the various kinds of social insurance. In each case where several statistical series are mentioned I have cumulated the series, beginning with the highest income brackets, and taken whichever cumulated figure was the lowest, to represent the proportion of benefits received by spending units with money incomes above a given point.

Railroad retirement benefits were distributed similarly except that the series relating to number were omitted, and Professor Musgrave's series representing railroad pay rolls was substituted for the series representing wages covered by social security.

Federal civilian pensions were also distributed on the basis of amounts, not number. The series used were incomes of units whose heads were retired or over sixty-five years of age (above \$4,000) and civil service wages, all wages and all incomes.

Unemployment insurance was allocated one-half on number and one-half on income. The series used were wages and wage earners covered by social security and a rather unsatisfactory series constructed by myself from census figures to represent the distribution of unemployment; also wages in general and money income.

Railroad unemployment insurance was allocated in the same manner, except that the series relating to number were omitted and the series for railroad pay rolls was substituted for the series for covered wages.

Government insurance was allocated one-half by number and one-half by income, since there was a maximum limitation on the amount of each man's policy. The beneficiaries, having lost their principal earner, were generally in lower income brackets than surviving veterans or persons still paying for life insurance or spending units in general.

Military pensions and disability and retirement benefits were distributed on the basis of both amount and number, since a large part of them were based on assumed need rather than on the recipients' previous earnings. The series used were the distribution of veterans aged twenty-five to forty-four and of all wage earners and (above \$4,000) the incomes of retired persons and of persons in the armed forces.

Adjusted compensation, mustering-out pay and terminal leave, readjustment and self-employment subsidies, and subsistence for veterans were allocated according to the number of veterans aged twenty-five to forty-four. But for distribution above \$4,000, the number in the armed forces or unemployed was also used.

"Other" transfer payments, both federal and state, were for many purposes; but were largely paid to institutions for the care of veterans and needy persons or for education. They were therefore distributed according to the number of spending units headed by veterans and of all spending units and the number of persons under eighteen in spending units.

The Department of Agriculture devoted its activities to promoting the welfare of farmers. Consequently, its budget is here allocated by farmers' income.

The Department of Labor devoted itself to the welfare of wage earners, especially those in industry. Its budget is therefore distributed one-half by wages and salaries and one-half by wages subject to social security.

With reference to both the Department of Agriculture and the Department of Labor, an economist more meticulous and bolder than I might attempt to allow for the results of their activities in raising the cost of living by distributing a negative benefit among consumers.

The Department of Commerce aids business concerns and corporations and, by encouraging production, benefits most income receivers and consumers of all sorts of manufactured products. Its budget is therefore allocated one-third by expenditures for consumption, one-third by money incomes, one-sixth by income from unincorporated business, and one-sixth by dividends.

Expenditures for education are distributed according to the number of children under eighteen in each income bracket. Although education is generally supposed to promote the general welfare, the primary beneficiaries are the students themselves, whose earning power and enjoyment of life are increased, and their parents, who are exempt from the necessity of providing education at their own expense.

Public housing is distributed primarily by the amount of rent paid; but since it is mainly intended for the benefit of poorer people, the allocation over \$5,000 is made by number of spending units paying rents, not by the amount of rent paid, and the proportions below \$5,000 correspondingly increased.

Federal expenditures for highways are apportioned one-half by consumption expenditures and one-half by automobile expenditures, to cover both the commercial and the individual use of highways.

State and local payments of interest are allocated like federal. State

and local civilian pensions were allocated like federal, except that an arbitrary allowance was made for the generally lower level of pay and pensions among state and local government employees. Sickness compensation is allocated in the same way as unemployment benefits.

Direct relief is allocated according to a schedule prepared from the N.R.C. and BLS surveys for 1935-36, 1941, and 1942, adjusted for changes in the distribution of income and in the value of the consumers' dollar.

State and local expenditures for highways not only facilitate the distribution of goods and the movement of individuals but also improve the value of homes and other real estate. Consequently the allocation used for federal highway expenditures has been modified by distributing one-third of them in accordance with an estimated distribution of the ownership of real estate.

The best that can be said for some of these allocations is that they are better than the crude assumption that these special benefits are distributed according to either income or expenditures. Rough as they are, they do establish the fact that insofar as the benefits of allocable government expenditures are concerned, the consumer units under \$4,000 got a larger share than would correspond to their incomes and those over \$4,000 a smaller one.

Now if we add the nonallocable expenditures, the distribution of total benefits must be stated as a range, because of the differing possible assumptions concerning the nature of governmental activities and their relation to the citizens' welfare. Column C of Table 1 shows the estimated distribution of all government benefits if the nonallocable benefits are distributed on the basis of life-expectancy in 1948 and on a per capita basis in the other years. Column D shows the results if non-allocable benefits are distributed according to ownership of capital in 1948 and according to income in the other years.

By all of the measures here used, the benefits of federal expenditures in 1948 exceeded the burden of taxes for all income classes under \$4,000 and the burden exceeded the benefits for all classes over \$7,500. The corresponding divisions for state and local governments were \$3,000 and \$4,000. Although state and local taxes were not as progressive as federal taxes, the distribution of state and local expenditures was more regressive. If unemployment insurance were classified, as it might well be, under the states rather than under the federal government, the regressive pattern of state and local expenditures would be even more pronounced.

Referring to Table 1, in which these data have been distributed by deciles instead of money income classes, we find that the lowest seven deciles received a larger proportion of benefits than their share of taxes



and the top two deciles received a smaller share, by both methods of allocating benefits.

The figures for 1929, 1935, and 1941 were worked out by similar methods, as far as the available material permitted. They all show that the lowest five deciles received a larger proportion of benefits than they paid for, while the top decile was in the opposite situation.

In conclusion, I believe that I have demonstrated that while our system of taxation is highly progressive if measured against income, it is even more progressive if measured against benefits received. Whether either of these forms of progression is desirable, and, if so, within what limits, is a matter deserving the most earnest attention of members of the economic profession and of all persons interested in the future welfare of our nation.

Redistribution of incomes by means of progressive taxation and regressive distribution of the proceeds may be an effective weapon for increasing the national income and improving the general welfare; or it may be a dangerous device that will halt or reverse the growth of national income and bring about economic, political, and moral deterioration. Like the scientists engaged in perfecting the atomic bomb, we owe it to our consciences to study the matter carefully and proceed with the utmost caution. Since the first requirement of cautious progress is to know where we are and in what direction we are facing, I submit this report to you as a preliminary step in the direction of a quantitative analysis of the problem.

## DISCUSSION

**HAROLD M. GROVES:** I have suggested to my students that reactions to the subject of tax incidence are analogous to those in theology. The agnostics of incidence of course are the ones who counter every query about the ultimate burden of tax with the question: Who knows? I myself was plunged into a heavy mood of agnosticism after observing the new trend toward the view that the effects of a general tax are to be found only in the impact on over-all demand. I thought the Rolph analysis brought the problem back to its proper setting and added a proper rigor. I was impressed by its logic but intuitively distrusted its conclusions.

I was hopeful that Musgrave would lead us out of this wilderness. With the advantage of having followed him through four versions of his manuscript plus considerable correspondence plus considerable homework, I am able to express the opinion with some confidence that he has at least carried us a long piece in the right direction.

He is right in his insistence that incidence analysis (at least in the case of a general tax) must start with and hold to assumptions regarding expenditure context: enlargement of expenditures, replacement of tax, or elimination of deficit. And I like his idea of abstracting from the effects of public expenditures by starting with the replacement of an existing tax.

He makes a noteworthy contribution in his illuminating and persuasive argument that the distributional effects of a tax may be independent of the direction of shifting: forward to the consumer in higher prices or backward to the factor payments.

His introduction of the idea that the incidence of a tax may depend on the value relationship between consumer goods and capital goods is ingenious and promising.

I started with deep skepticism of Musgrave's simplified models—a reaction which to some degree persists. He would probably be the first to admit that his models are in need of further refinement and "desimplification." He now brings the factors of interest and wages into the picture. But what about rent and profits? Rent could probably be dismissed as a special case of interest, but profits of whatever species can hardly be ignored. Frankly I am more than a little terrified at the prospect of applying his model to a world in which there are not only four factors of production but goods involving all degrees of these factors and incomes equally mixed in pattern.

Suppose we approach the problem of the incidence of a general sales tax from the standpoint of what kind of a levy would come nearest to neutrality, defining neutrality as a proportional net income tax on all net income. This would require not only neutrality between brackets but also within brackets. I always supposed that a tax on the final sale of consumption goods would best meet this test. Musgrave's analysis, if it is valid and if I understand him, indicates that this may not be true. There would be a gain for neu-

trality (at least on some assumptions) by bringing capital goods in under the levy. However, insofar as the additional tax does fall on consumers, it will create an unneutrality among individuals according to their consumption patterns—the degree to which they buy goods involving large input of capital.

Failure of a tax to reach certain consumption such as personal services, a common failing of sales taxes, would presumably cause a similar unneutrality. Of course the economic system compensates for these unneutralities as it does for a partial excise, to a degree and at a price. It may well be that unequal treatment of equals is as important an argument against sales taxes as their alleged regressivity.

Of course, one kind of economic activity that is impervious both to the income tax and the sales tax is consumption without exchange. This brings me to the work of Dr. Tucker on income and tax distribution. Whatever else Dr. Tucker may have accomplished by calling attention to this income without exchange, he has focused upon the fact that low bracket incomes are a miscellaneous class about which we should have a great deal more quantitative data. Some low incomes represent cases of families that are chronically and desperately poor; others represent cases of families that are at least not so poor as they seem because they are largely "self-sufficing"; and still others represent persons who are temporarily in low brackets or who have small responsibilities and perhaps offer themselves to the labor market only for part-time work.

As for Dr. Tucker's current attempt to allocate all the benefits of government by spending units, I regard it for the most part as an unprofitable occupation. I go along with the famous dictum of John Stuart Mill that "Government must be regarded as preeminently the concern of all citizens enjoyed by all in their *corporate capacity*." I find myself quite unable to agree, for instance, that the exclusive benefit of educational outlay may be allotted to the spending units according to their number of school children. The schools are simply one of the amenities of civilization that we enjoy in our corporate capacity as the public. How they shall be paid for is also determined in our corporate capacity as the public.

Having participated as an observer in the earlier phases of the Musgrave-Tucker debate, I rather hoped that Dr. Tucker would reiterate and reinforce his position with regard to at least two issues there sharply drawn. These concerned the rebracketing required in grafting nonmoney income data onto money income data and the propriety of allocating taxes on undistributed corporate income to stockholders and not doing the same with the income itself. While on earlier occasions Dr. Tucker has defended his position on the second of these matters (though I think on the whole not convincingly), he has never to my knowledge re-examined his treatment of the first.

The Tucker-Musgrave debate provokes the question: Why is it that the tax system shows so little progression in the lower and middle lower brackets? A considerable and interesting factor in this situation obviously is the existence of personal deductions and credits for taxpayer, spouse, and dependents.

These allowances do amplify progression within a given family status group among units that pay some tax. Obviously they leave the same percentage tax burden—namely zero—among the taxpayers who pay no tax. The income tax progression for families of six starts at \$4,000 income. The idea of protecting certain amenities of life from all taxation is thus in some degree contrary to progression—an independent objective of tax equity. It appears to be a good objective—at least until we observe that through other levies the lowest incomes are paying in taxes around 20 per cent of their receipts.

Statistics of tax burdens by spending units involves the necessary confusion that it attempts to compare the incomparable; that is, the relative progressivity of taxes on families not only of different size of income but also of different size of family. Progression could be measured, to be sure, on a per capita basis, but this would ignore the important fact that the recipients of income do not fully share the power and benefits of their intake with their dependents. The cross which the Eightieth Congress found hard to bear is also one that statisticians cannot escape.

Those who are concerned about the flatness of the tax distribution curve are directed very properly to a re-examination of state and local taxes where a regressive ingredient lies. But here again we are reminded that progression (in my view a desirable end in itself) is only one of many objectives of the tax system. The maintenance of the virility and independence of local government also is involved. The trick is to make state and local tax systems less regressive without making them less independent. I have some thoughts as to how this could be done, but I shall save them for some other occasion.

EARL R. ROLPH: These remarks will not, of course, be a substitute for close study of the interesting contributions of Dr. Tucker and Professor Musgrave. Dr. Tucker has assembled a large amount of data in an attempt to quantify the distributions of taxes and government benefits by income groups. His work is instructive regardless of whether or not one agrees with his theoretical beliefs concerning the shifting of specific taxes. Although there are many debatable points in Dr. Tucker's presentation, I shall concentrate on two: the treatment of corporation income taxes and the allocation of government benefits.

Dr. Tucker attributes all of the unshifted portion of corporate taxes (assumed to be 50 per cent of their yield) to stockholders without following the usual procedure of imputing corporate retained earnings to stockholders. What is the justification of this procedure? If I understand him correctly, this theory means, apart from possibilities of shifting, that a reduction of corporate taxes by a dollar increases dividends by a dollar. I have trouble believing that in case corporate taxes are reduced, managements of large corporations are likely to be this generous with their stockholders. I have tested Dr. Tucker's theory of the relation between retained earnings and effective tax rates by examining the dividend policies of one large corporation for the period 1947-51. Contrary to his theory, I do not find that retained earnings are a constant percentage of corporate net earnings before deductions for

income taxes.<sup>1</sup> No doubt a study of many corporations would reveal different results, but until more conclusive evidence is forthcoming, Dr. Tucker's view that federal income taxes levied on corporations are entirely at the expense of dividends appears to be untenable.

I thoroughly agree with Dr. Tucker that any pertinent and comprehensive picture of the redistributive effects of government fiscal measures should include government subsidies. A strictly proportional income tax becomes, for example, a progressive system of income redistribution if the government also pays lump-sum cash subsidies on a per capita basis. But I can see no justification for attempting to allocate to individuals all government expenditures including even defense expenditures. Such functions are designed to meet social objectives of a type which cannot even in principle be assigned to particular living persons. The allocation of these government functions to particular persons adds nothing to our knowledge, and it falsely suggests that government could be eliminated altogether if individuals were to decide that they no longer desire government services for their own use.

Dr. Tucker has many precedents for the treatment of interest payments on a government debt as equivalent to negative taxes on bondholders. Nevertheless, this practice appears to be incorrect. Government interest payments perform the social function of preventing expenditure and price inflation because if the government were to cease making interest payments and thereby convert its debt into money, people would be invited to bid up the prices of goods and services. Interest is not a subsidy; it is a payment to induce people to hold their wealth in the form of debt instruments instead of holding all their wealth in other forms. The test of efficiency in this matter is the extent to which the promise to pay interest prevents a rise in the demands for goods and services, including new real assets. If, by contrast, interest on government debt were merely a subsidy to present debt holders, the Treasury might well economize by eliminating its interest expense. It would be difficult to find a sensible reason for subsidizing this relatively wealthy group on such a large scale.

I suggest that in any future study, Dr. Tucker forego attempting to distribute all government expenditures and instead limit the concept of government benefits assignable to private groups to noncontractual transfer payments and to subsidies paid in kind.

Professor Musgrave wrestles with the fundamental question of what tax incidence is all about. In the discussion of what he calls absolute incidence, he persists in refusing to attribute to government expenditures the effects of

<sup>1</sup>The computations relate to General Motors Corporation and show retained earnings (column 1), foreign and federal income and excess profits taxes (column 2), and dividends paid to stockholders (column 3) as a percentage of total net earnings before deducting income and excess profits taxes.

	Column 1	Column 2	Column 3
1947	26.04	47.52	26.44
1948	28.66	45.04	26.30
1949	25.97	41.64	32.39
1950	16.28	53.96	29.75
1951	9.61	66.00	24.40



those expenditures and to attribute to taxes the effects of those taxes. Because he fails to make this distinction, he concludes that a tax must impose a real burden on the public. Let me call attention to only one example to reveal the fallacy of this persistent belief. A number of European countries after the recent war, finding large amounts of money in private hands, used tax devices to reduce spending power and to prevent by this means some price inflation and social disturbance. Any taxes used for such purposes need not, I submit, impose a real burden on private groups; on the contrary, the results of the taxes are presumably better from the public's point of view than the relevant alternatives. Yet Musgrave defines absolute incidence to mean that a real burden must be imposed on some group. Such an important proposition should at least be defended, it seems to me, rather than assumed.

I altogether agree that the technique of studying one tax under conditions of constant government revenue, i.e., by varying the yield of another tax, is proper and instructive. But its relevance is expository simplicity. The technique saves having to discuss repeatedly the deflationary effects of each particular tax. I see no valid reason for elevating this device to an ultimate principle as Professor Musgrave appears to do by his concept of differential incidence. Economists should be free to advise government officials that the reduction of some tax or set of taxes may not increase the public's real income. Such advice may soon need to be given.

I must object to Professor Musgrave's method and conclusions in relating excises to capital values. The introduction of a discount rule appears superfluous and misleading. If the government chooses by its tax policy to exclude new capital items from excise taxation, it thereby encourages a shift of resources from the production for consumption to production for investment purposes. In this respect, the effects of selective excise taxation are similar to those found in cases of selective taxation of final consumption products. The income effect of an excise tax policy which discriminates against consumption items consists of reducing the money earnings of owners of resources in the taxed fields and through competition in other fields. Since new resources must compete for earnings with old ones, the income they can be expected to earn in future periods falls because of the tax.

There are two factors tending to change rates of anticipated net return (discount rates) at the margin of investment: the fall in the price of new real assets because of their augmented production and the fall in their future net earnings because the tax reduces factor returns. Whether the "discount rate" rises or falls depends upon the magnitude of these two changes. In contrast to this view, Musgrave assumes first a fixed and then a reduced "interest rate" and develops their implications on alternative assumptions concerning tax shifting without presenting an analysis to determine how various patterns of excise taxation affect this disembodied rate. His presentation appears to be based upon the time-preference view that "saving" depends upon interest rates. If so, this position conflicts with the prior assumption that the "saver" spends the whole of his income on new real assets. Investment demand cannot be treated as given and as a variable at one and the same time. Musgrave's discounting arguments appear to be a retrogression from an earlier effort by

him which, to my way of thinking, poses the issues of the relation between the taxes, capital values, and yields in an essentially correct and informative manner. (See E. D. Domar and R. A. Musgrave, "Proportional Income Taxation and Risk-Taking," *Quarterly Journal of Economics*, May, 1944, pages 388-422.)

On excise tax theory, Professor Musgrave has a feeling that in the typical case excise taxes raise prices. I detect some hesitating agreement with my outrageous suggestion that excise taxes, whether general or partial, are not shifted to consumers under competitive pricing arrangements. Now that the seeds of doubt have been planted, I suggest that for noncompetitive markets our progress will be more substantial if we bring the large amount of research of power-pricing tactics to bear on tax shifting and avoid the temptation of relying upon intuitive generalizations about empirical questions. Students of price policies must be getting tired of an orientation directed toward anti-trust policies and unraveling the mysteries of workable competition. They may welcome an invitation to investigate such matters as tax-induced collusion. Tax theory is the concern of the entire profession because taxes have ramifications in every area. One of the main tasks of specialists in fiscal economics is to provide the theoretical framework to guide such research.

RICHARD B. GOODE: In his statistical study Dr. Tucker, like previous investigators, has assumed that excises and sales taxes are paid by consumers. In a superficial sense this is obviously true. Market prices do equal the total of factor costs plus so-called "indirect taxes." The more meaningful interpretation of the assumption, however, is that the taxes do not reduce factor rewards, either in the taxed field or in other employments, below the level that would prevail if the taxes were not imposed. This proposition conforms to the popular view; and, for the long run, it is supported, with comparatively minor exceptions, by partial equilibrium price theory.

Although forward shifting seems plausible, many of us must have felt some uneasiness if we stopped to consider exactly how the process was supposed to operate on the large scale required to account for all excises and sales taxes levied by federal, state, and local governments. Several years ago I decided that the partial equilibrium theory could not justifiably be extended to taxes of broad coverage and large yield. These taxes, it seemed, could best be analyzed by considering their impact on aggregate money expenditures, the price level, employment, and real income.<sup>1</sup> More recently, Professor Rolph challenged the traditional theory even as applied to small taxes, concluding that these taxes not only raise the price of the taxed commodity but also lower money incomes of factors of production in both the taxed industry and other fields.<sup>2</sup>

Professor Musgrave has counterattacked with an able argument to the effect that general equilibrium considerations do not destroy the presumption that consumers rather than producers as such bear excises and sales taxes

<sup>1</sup> "The Corporate Income Tax and the Price Level," *American Economic Review*, March, 1945, pp. 40-58; *The Corporation Income Tax* (John Wiley & Sons, 1951), pp. 44-72.

<sup>2</sup> Earl R. Rolph, "A Proposed Revision of Excise-Tax Theory," *Journal of Political Economy*, April, 1952, pp. 102-117.

on consumer goods. He argues that the question whether the taxes are initially shifted forward in higher prices or backward in lower money incomes for the factors of production is of secondary importance for real, long-run incidence. In either case, relative prices of taxed commodities rise. Prices of untaxed commodities and money rewards of the factors decline in equal proportions if initial backward shifting occurs or remain constant if market and monetary conditions allow initial forward shifting. Granted certain simplifying assumptions, no one suffers any real burden in his capacity as a producer or as a consumer of an untaxed commodity, but consumers of the taxed commodities surrender purchasing power to the government. This is the situation only after all necessary adjustments have been made in response to the imposition of the tax.

My first comment is that the adjustment process outlined by Musgrave is considerably more complex than that usually contemplated in partial equilibrium analysis. The operation of the process depends on the state of aggregate demand. For example, under inflationary conditions an excise tax or a special profits tax may be wholly at the expense of windfall gains of producers. Furthermore, the adjustment may affect employment and real income. To illustrate, consider what happens if the government substitutes a retail sales tax for an individual income tax at a time when there is neither inflationary nor deflationary pressure. Normally consumers can be expected to spend only a fraction of the increase in their disposable income. But, in order for market prices of taxed commodities to rise by the full amount of the tax and all other prices to remain unchanged, consumers or some other sector must increase spending by the full amount of the sales tax revenue. If total spending does not increase that much—and I see no reason why it usually would—the tax can be passed on in full only if other prices fall. Price and wage rigidities make that difficult. The government may act to eliminate any unemployment resulting from a determined effort of the taxed industry to raise prices by the full amount of the tax and an equally determined resistance to price and wage cuts in other industries. But such action can be expected only after the disturbance has appeared and ordinarily only after it has become serious. I sympathize with the desire to separate issues of distribution from those relating to aggregate demand and total real income, but I fear that we cannot realistically do so.

Second, even if we ignore aggregate income considerations, we should not overlook the time element in the incidence problem. An excise or a differential income tax is, in the first instance, a tax on producers. It may become a tax on consumers, but only if supply is somewhat elastic. In the short run, supply may in fact be highly inelastic. Specialization and other immobilities nearly always limit the elasticity of supply, often for a period of many years. Sometimes a generation may be required to equalize factor returns in the taxed industry and other fields. A tax on a good produced with the aid of a unique natural or human resource may in the long run rest entirely on the owner of the resource.

Because the adjustment process is complex and time consuming, a cross-section picture drawn at any given moment on the assumption that all adjust-

ments have been completed may be seriously misleading. This is especially likely if the tax is of sufficiently large yield and coverage to have important repercussions on aggregate income and employment. Perhaps this all comes to saying that the method of comparative statics adopted by Musgrave, although a legitimate analytical device, omits in this instance a large share of the problems that ordinarily concern students of fiscal policy, monetary theory, and business cycles.

Now I should like to make a few remarks prompted by Dr. Tucker's interesting paper. As regards the distribution of taxes by income groups, the most significant peculiarity of Dr. Tucker's method is his treatment of undistributed corporate profits and taxes on them. He imputes to shareholders the whole nonshifted portion (one-half on his assumption) of the corporation income tax but does not impute to shareholders any part of retained profits net of tax when he calculates effective tax rates. This gives a somewhat more progressive tax distribution in upper income groups than would a procedure which imputed all retained profits to stockholders. It would seem more consistent either to impute all retained net profits and nonshifted corporate taxes to stockholders or to allocate to them only the portion of corporate taxes assumed to come out of dividends. I am inclined to prefer the latter procedure. Changes in undistributed profits are at most unrealized changes in the value of stockholders' property, and it is not feasible to allow for all such changes.

Dr. Tucker's statistics on the distribution of benefits from government expenditures are the more novel part of his paper. He recognizes that some of the underlying assumptions are rather shaky, and for a large fraction of total expenditures he presents alternative bases for distribution. My main doubt is whether it is realistic and useful to attempt to allocate to individuals the benefits of expenditures for national defense, general government, conservation of natural resources, and the like. The present generation has, in a sense, an "undivided interest" in the maintenance of political and social institutions which are protected and supported by such expenditures. Future generations, we hope, will receive a large part of the benefits of these activities, just as we inherited a large body of social capital partly attributable to past government expenditures. Specific allocation of benefits from these general activities implies a rather artificial view of society or a question-begging assumption that individual benefits take the form of satisfaction of altruistic interests in the welfare of one's fellow citizens and of future generations.

One important aspect of distribution that is only indirectly revealed in the statistics on taxation and benefits in relation to income is the effect of government programs on ownership and use of economic resources. For example, one of the most significant results of expenditures on public education is the fact they have destroyed the scarcity value of literacy. The consequences are reflected partly in the movement of relative wages of clerical and manual work. Patents, to take a different kind of example, help preserve scarcity values and affect income distribution even though their granting and protection involve very small government expenditures. Many other illustrations of

how the state creates or destroys economic resources or changes their ownership will occur to you.

In conclusion, I should like to say that my remarks are not intended to support a diffusion theory regarding incidence of taxation and benefits from government expenditures. Certainly there are significant distributional differences among taxes and expenditure programs. On the other hand, I believe that we must concede that the process by which taxes and government benefits are distributed is much more complex, time consuming, and far-reaching than we have usually assumed. And because this is so, we know much less about these matters than we often like to think we do.

I infer from this that we need more—not less—study of both a theoretical and empirical nature. We need better hypotheses and more empirical verification of them. In this study, however, I doubt that it will be useful to attempt to maintain a sharp distinction between the pure problem of incidence, as defined by Musgrave, and other effects. We do need working hypotheses regarding the immediate or short-run incidence of taxes and expenditures to form the basis of further investigation. The best course may be to develop these hypotheses as carefully as possible and then to go on to study the broader implications of government fiscal activities without much attention to long-run incidence that would be realized only in a new equilibrium that may never be reached.



## DISTRIBUTION AND UTILIZATION OF NATURAL GAS<sup>1</sup>

ELI W. CLEMENS, *Chairman*

DUDLEY F. PEGRUM: The Natural Gas Act brings to focus the principal issues of public policy for natural gas. The record of administration of the Natural Gas Act has been one of vacillation, litigation, and confusion. There are four principal reasons for this: (1) the Federal Power Commission has had no consistent policy (some of the members of the Commission have endeavored to push the scope of the Act to its extreme limits); (2) the Supreme Court has failed to interpret the Act in a definite way and has avoided the responsibility of establishing reasonably ascertainable bounds within which an administrative agency must operate; (3) Congress has failed to clarify the issues by appropriate legislation; (4) much of the confusion and failure to act decisively arises from the newness and difficulty of the problems themselves.

The problem of natural gas as it relates to production and gathering arises from the fact that the transmission lines own the commodity which they offer for sale. The Federal Power Commission must therefore determine the cost (price) to be allowed for the gas which the natural gas pipe lines transport. If this were always a competitively determined price, it would not present any difficulty. But many of the pipe lines own natural gas reserves and secure at least a portion of their supply from them. To fix the price of gas produced by the pipe lines on the traditional public utility basis does not seem to be a satisfactory procedure because the production of natural gas does not have the characteristics of a public utility which are necessary to make such regulation workable. To exempt arm's length bargaining from such regulation would exclude about 86 per cent of the natural gas produced in this country. In the course of time it would result in the separation of all ownership by transmission lines. Not to exclude arm's length bargaining would require extensive regulation of the petroleum industry by the Federal Power Commission.

A fair field price seems to be the only workable solution to the problem. That it is workable is borne out by the fact that so many of the natural gas companies already buy all of their supply and that transmission lines as a whole produce less than 20 per cent of their own requirements.

The Federal Power Commission is supposed to prescribe just and reasonable rates of the natural gas pipe lines but it cannot regulate direct industrial sales made by them. The function of prices is to allocate commodities to their various uses; that is, prices are a rationing device. When the level of prices as well as the relative prices are fixed by a regulatory agency, the allocation

<sup>1</sup> Abstracts of the papers presented were submitted by W. H. S. Stevens and Eli Clemens, who were responsible for organizing this session on behalf of a group of members interested in the fields of public utilities and transportation.

of the joint and fixed costs by that agency will have an important bearing on the use of the commodity. The allocation of fixed and joint costs cannot be made in any logical way. Because of this, policy considerations can and should be given the greatest weight in the devising of rate structures. The decision as to who should bear the burden of nonallocable costs rests on judgment and therefore should be borne primarily by the so-called "inferior" uses if these are to be curtailed in their consumption of natural gas.

Conservation of a natural resource means putting the resource to the uses which have the greatest present value. This involves the weighing of current use under currently available techniques of production against prospective future uses under unknown and uncertain techniques. Under present conditions this calls for measures designed to prevent the flaring and careless extraction of natural gas. The Federal Power Commission can aid in the program by adopting the fair field price for the cost of the gas in the field and by adopting rate structures that will place more of the burden of fixed and joint costs on the lower price uses.

The law should deprive the Federal Power Commission of jurisdiction over all production and gathering. The Federal Power Commission should be given control over all wholesale sales made by natural gas companies and it should be empowered to establish rate schedules in the interest of a public policy designed to promote the efficient production and use of natural gas. It should also be given control over all the public utility facilities of the natural gas companies and should be empowered to regulate the financial practices and security issues of these companies.

HORACE M. GRAY: Professor Pegrum advocates a "market-oriented" or price-implemented policy for the conservation of natural gas. Field prices would be raised by restriction of output; consumer prices would be increased by public utility regulation. The first action would stimulate producers to utilize natural gas more efficiently; the second would eliminate or reduce low-value uses among consumers. All attempts to deal with the conservation issue "on a physical basis outside the price mechanism are totally unsatisfactory and doomed to failure."

The reasoning adduced in support of this proposed policy is largely irrelevant because the problem is not solvable by market action. The conservation of natural resources is a social problem, not a private one; it must be analyzed in social terms, not in terms of private costs and revenues; it must be solved by social action directed toward social goals, not by private action motivated by individual self-interest; it cannot be forced into the narrow mold of the private market nor solved by price manipulation.

Professor Pegrum's objective is to get as much conservation as can be had from private enterprise through the price mechanism. This is a minimal and essentially negative program; it falls far short of being adequate in terms of modern, positive conservation theory. There is no assurance, however, that even this minimum goal will be realized. Throughout our history natural resources have been exploited by private enterprise under a free price system but with devastating waste and disregard for the public interest.

Public utility price regulation has little value as a conservation technique. In the restricted form herein proposed it would operate only against consumers, whereas the basic problem of conservation centers in production. Examples can be found, among electric, gas, and water utilities, where limited conservation effects have been achieved by this method but they are minimal and incidental. There is no case, to my knowledge, where significant large-scale conservation results have been attained at the basic production level by public utility price regulation.

Professor Pegrum's proposals do not add up to a conservation policy, as that term is understood in modern usage. Conservation is synonymous with scientific utilization of natural resources; i.e., maximization of utility through the full use of the best available scientific and technical knowledge. This requires that natural resources be dealt with in direct, physical, down-to-earth fashion. The essential factors are capital, technology, organization, and scientific research. These must be mobilized and directed toward approved social objectives. To deny this principle, as Professor Pegrum does when he abjures all direct, physical methods, is to repudiate all the lessons of recent experience.

The price system is a vital institution in a free economy but its functions are limited and it cannot solve complicated social problems, such as the conservation of natural resources. We render a disservice both to the price system and to public welfare when we refuse to recognize these limitations and insist that the price system must solve problems beyond the range of its functional capacity.

H. J. O'LEARY: The introduction of natural gas in Wisconsin was delayed from 1941 to 1949. The Wisconsin Legislature, which yielded to the opposition of coal, railroad, and labor interests, contributed to the delay by passing repressive legislation and excessive taxes applicable to natural gas service. In 1941, wellhead prices in the producing areas were low, and the producers of natural gas were so anxious to serve the Wisconsin market that they were willing to share some of the costs of converting customer appliances and the abandonment of production facilities.

In the interval between 1941 and 1950 the buyers' market for natural gas was replaced by a sellers' market. Wellhead prices increased sharply, competition for gas reserves was intense, and the cost of extending pipe lines had increased almost threefold. The delay in securing gas cost Wisconsin distributors at least 30 to 50 per cent more for gas at the city gate.

The delayed arrival of natural gas, however, was highly beneficial to distributing companies and their customers. The cost of gas was cut substantially, rates were reduced about 25 per cent, service was improved, and sales increased substantially, particularly for spaceheating and industrial service.

Rates to customers, however, continue high due principally to lack of an adequate supply of gas, continuously increasing city gate rates, high initial cost of converting customer appliances and rehabilitating distribution systems, and increased labor and tax costs and the cost of maintaining stand-by facilities.

JOSEPH R. ROSE: Distribution of natural gas does not raise the provocative problems characteristic of production and transmission. It does, however, introduce the problem of what disposition for rate-making purposes should be made of manufactured gas facilities. The Wisconsin Commission includes these facilities in the rate-base as stand-by equipment.

This problem has confronted other commissions (*Report of Committee on Rates of Public Utilities to National Association of Railroad and Utilities Commissioners*, 1950, page 6). In 1936 the Pennsylvania Public Service Commission excluded the manufactured gas plant on the ground that the plant would not have been built had natural gas been originally furnished (15 Pa. P.S.C. 511, 534). On appeal the Superior Court reversed the Commission in 1937 (128 Pa. Superior Ct. 195, 215).

The Supreme Court of the United States indicated in 1933 that historical cost requires inclusion of the plant and reproduction cost its exclusion (289 U.S. 287, 311).

Economic principle sustains the Pennsylvania Commission because past decisions should not influence price-making in the present.

## PROSPECTIVE DEVELOPMENTS IN FEDERAL REGULATION AND CO-ORDINATION OF TRANSPORTATION<sup>1</sup>

KENT T. HEALY, *Chairman*

EDWIN C. JOHNSON: A decision must be made as to whether the national transportation policy as stipulated in the Transportation Act of 1940 is to continue to be the basic policy. Since there has been no evidence that there is any general dissatisfaction within the industry regarding the objectives of this policy, these purposes remain, and we must assume that the foundation of our national transportation policy has been established, for the present. The promotional activities of the federal government have often operated to prevent the sound economic conditions which were stipulated in this transportation policy. It is obvious that subsidies granted to selected forms of transportation are inconsistent with those provisions of the national transportation policy which relate to fostering "sound economic conditions in transportation" and to preserving the "inherent advantages of each" form of transportation. In addition, there are many indirect effects, such as shifting a part of the subsidy burden from the cost of transportation to taxpayers in general. When this is done—and there are many instances when it is done—it can hardly be contended that reasonable charges for transportation services have been made.

If and when the transportation industry formulates a national policy and decides to recommend to Congress the continuance, elimination, or the modification of subsidies, then it behooves it to suggest legislative changes which would amend the present national policy so as to make its provisions applicable to all agencies of the federal government engaged in regulating or promoting any form of transportation. Of course, this is based on the belief that our national transportation policy should cover all forms of regulated transportation, including transportation by air. I do not believe that the declared policy of Congress can ever be achieved so long as economic regulation and promotional activities continue to operate at cross-purposes.

It is the responsibility of the transportation industry, which includes all forms of transportation—railroads, trucks, buses, waterways, airlines, pipe lines, etc.—to chart their course and then present it to Congress for acceptance or rejection. It is essential that an *esprit de corps* within the transportation industry be developed so that Congress can be presented with a unified declaration of national policy which is broad enough and clear enough to satisfy the needs of the industry and to develop and preserve a strong, healthy, well-balanced national transportation system.

<sup>1</sup> Abstracts of the papers presented were submitted by W. H. S. Stevens and Eli Clemens, who were responsible for organizing this session on behalf of a group of members interested in the fields of public utilities and transportation.



JOHN H. FREDERICK: In approaching the many problems involved in legislating for transportation it must be realized that they involve a general transportation system—a system composed of important competing agencies. The problems are, moreover, complicated by the fact that each type of transportation is capable of performing a service that in some respects has advantages over all its competitors. This makes the transportation problem of this nation essentially one of competition.

For some years the steps to be taken in improving the transportation legislative situation have lacked definiteness. Carrier managements, for example, have not been willing to specify just what changes in the political and regulatory framework they needed in order to again be prosperous. This deficiency has largely been overcome through the definite statement of what are considered to be the "irreducible minimum needed in revising our national transportation policy to serve the national interest in the restoration of economic health to the transportation industry." These have been concurred in by all types of carriers, by shippers, and by investors in transport facilities and are:

1. Reduce from a year or more to a thirty-day limit the present time lag between the occurrence of increased costs to the regulated carriers and their authority to change their rates to reflect such increased costs.
2. Call upon the Interstate Commerce Commission to permit a level of railway rates which will provide earnings at a ratio sufficient to attract an adequate supply of invested capital.
3. Where state authorities refuse to permit the railroads to abandon services operated at a loss, authorize the Commission to permit such abandonment if it finds that the facts substantiate the railroads' contention that these services are a drain on their resources.
4. Require contract carriers by highway, water, and air to file, make public, and adhere to the rates they actually charge.
5. Require keeping parcel post charges at a level sufficient to cover the costs of service.
6. Remove the government from the fields of transportation operation through the immediate disposal of the Inland Waterways Corporation.
7. Require the federal government to ultimately impose user charges for government-provided transportation facilities with the aim of making such charges to commercial users sufficient to cover their fair share of the cost of building and maintaining the facilities.

The transportation industry can "speak in a voice which will be heard." A reasonable, modern, comprehensive program has been proposed.

JACK GARRETT SCOTT: For this audience my assumption is that co-ordination with respect to transportation refers to the consistency of governmental transportation policies and that promotion refers to the activities of the government in the provision of physical aids to transportation. There is and always has been a woeful lack of consistency, integration, or unity in the activities of the various departments and agencies of the federal government in matters affecting transportation. Because of their diverse interests in trans-

portation, their views on legislative, regulatory, or administrative proposals often differ sharply. There are 40 major agencies in which there are 164 separate bureaus and divisions performing transportation research functions of one kind or another. There is also an apparent lack of co-ordination between the policies of major economic regulatory agencies. The Interstate Commerce Commission has been directed to foster and promote the economic welfare of those types of transportation which are within its jurisdiction. Similar mandates, not identical in wording, have been given to the Civil Aeronautics Board and the Maritime Board in their respective areas. No instrumentality exists which can unify or correlate the decisions of these independent agencies on the broad ground of what is best for all transportation.

One of the most grievous situations involves the promotional activities of the government. Literally billions of the taxpayers' dollars are spent for transportation promotion as a whole, but the right hand does not know what the left hand is doing and apparently never has known. Also serious is the lack of real co-ordination between promotion and regulation.

In his letter to Congress transmitting Reorganization Plan No. 21 of May, 1950, proposing creation of the office of Under Secretary of Commerce for Transportation, the President stated that he proposed to look to the Secretary of Commerce for leadership with regard to transportation problems and for the development of over-all transportation policy within the Executive Branch. The Department of Commerce has no ambition or desire to take over any of the economic regulatory functions of the government.

The progress which has been made during the past year can be recapitulated as follows:

1. Formation of a Transportation Council of sixty leading transportation men, similar in concept to the Business Advisory Council.

2. Establishment of a program for examination and analysis of the major transportation problems; viz., government promotional activities, transportation user charges, government regulatory activities, co-ordination and consistency between promotional and regulatory activities, and miscellaneous questions not falling within the foregoing classifications.

The hypothesis has been that no sound policy can be established unless supported by thorough and impartial interpretation of the facts and the necessary comprehensive research required in that connection.

CHARLES S. MORGAN: While one may sympathize with various of the objectives stated by Mr. Scott, certain basic issues have not been explored fully.

Co-ordination of the views and work on transportation of the many non-transportation federal agencies is not possible short of freezing this part of their activities, though voluntary co-operation on particular matters can be helpful. There is more than research in Mr. Scott's list of activities of these agencies. Some wasteful duplication or misdirection of efforts doubtless exists.

Unification or correlation of the decisions of the independent regulatory agencies, proposed by Mr. Scott, can mean no more than analysis of decisions and presentation of data and viewpoints to the agencies responsible for policy

or administration. There is no valid objection to such a program, so understood, and there doubtless are opportunities of seeing transportation as a whole that are denied the separate agencies.

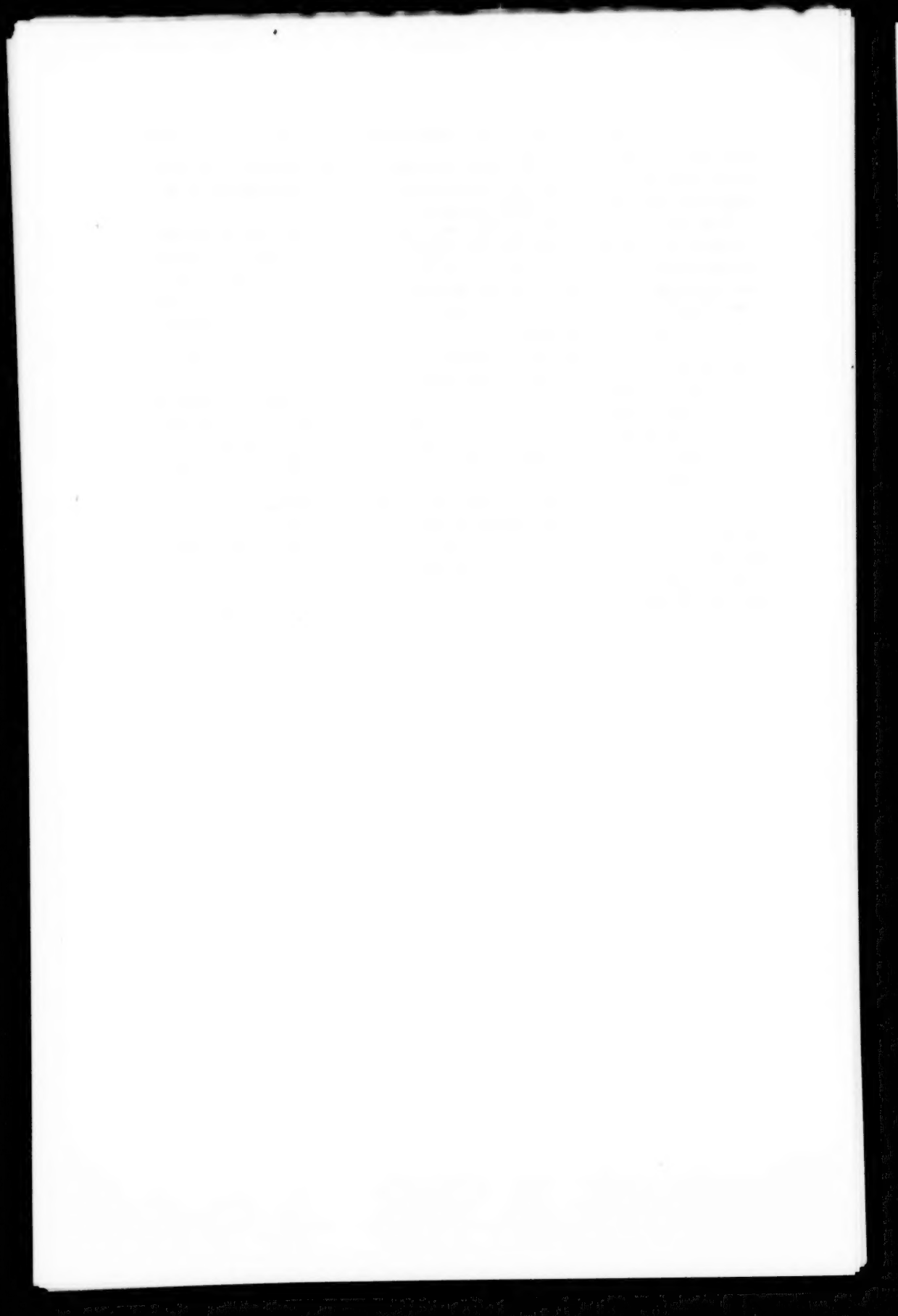
There is oversimplification in the idea that there can be a central determination of how much in total the government can afford to spend in providing transportation facilities and then a division of this fund among modes of transportation according to certain economic criteria. Mr. Scott's view that promotional activities require co-ordination is sound, but the problem possibly has been somewhat overstated.

There are, as Mr. Scott notes, conflicts between promotional and regulatory policies, but some overemphasis of the issues may be involved.

A survey of more recent developments indicates further clarification of the "public aids" problem but also added complications and unresolved basic issues as programs calling for action appear to approach more nearly to the policy-making stage. Fact-finding precedent to possible legislation will prove a large task.

The administrative setup that may be desirable for implementing revised procedures for passing on transportation projects and administering user charges, if Congress were to approve such programs, involves considerations of interest to both Congress and the Executive Branch.

In general, the Department of Commerce program in transportation seems less comprehensive than appears from certain language in Mr. Scott's paper.

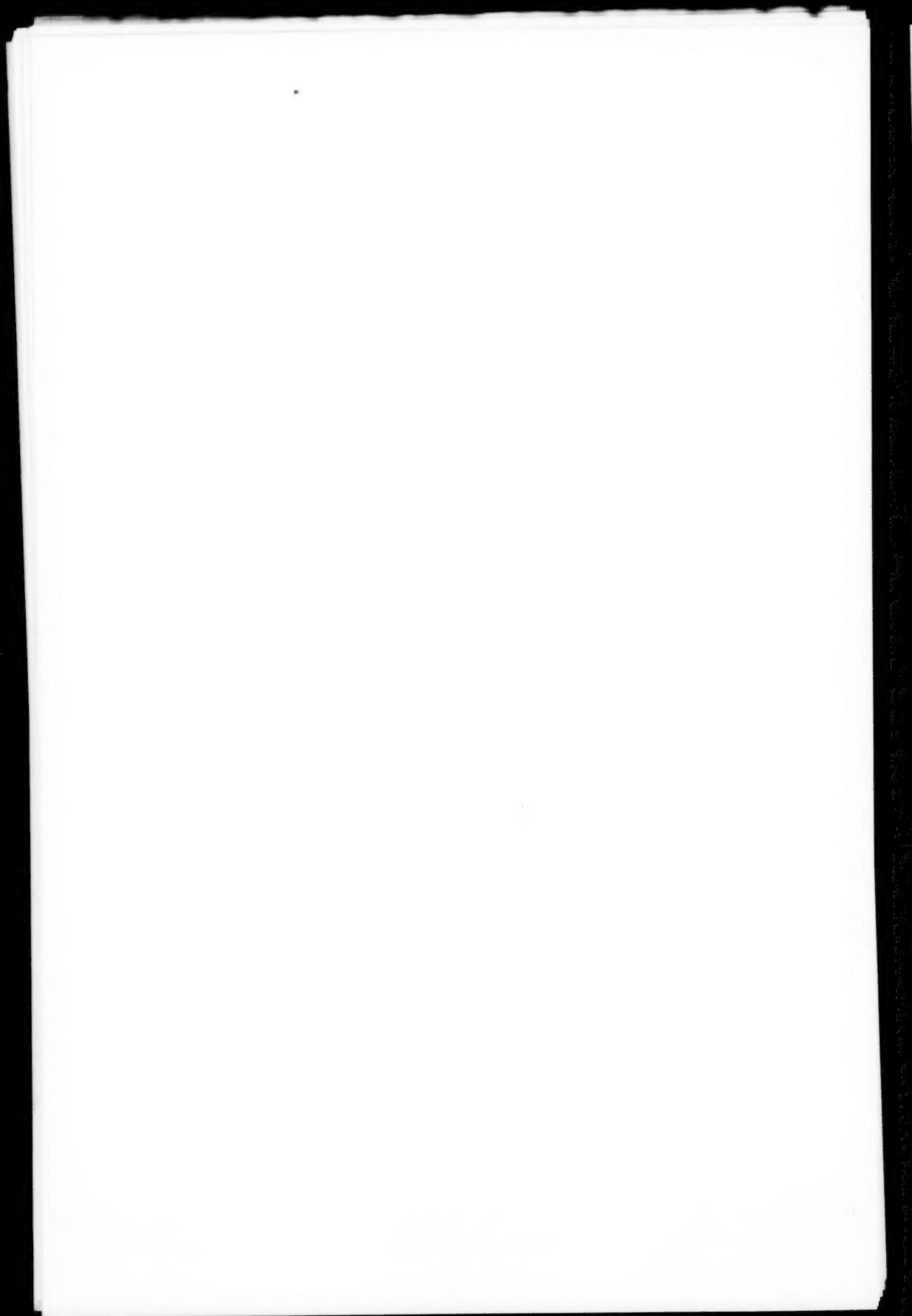


AMERICAN ECONOMIC ASSOCIATION

PROCEEDINGS OF THE SIXTY-FIFTH  
ANNUAL MEETING

CHICAGO, ILLINOIS  
DECEMBER 27-29, 1952





## PROCEEDINGS OF THE AMERICAN ECONOMIC ASSOCIATION

ANNUAL BUSINESS MEETING, DECEMBER 28, 1952

CONRAD HILTON HOTEL, CHICAGO, ILLINOIS

The Sixty-fifth Annual Business Meeting of the American Economic Association was called to order at 5:00 P.M., December 28, 1952, at the Conrad Hilton Hotel, Chicago, Acting President Arthur F. Burns presiding. The meeting was well attended (175-200).

In his introductory remarks, Professor Burns expressed sorrow over the untimely death of President Harold A. Innis, noted the services to the Association rendered by the Secretary, and invited all members of the Association to attend the Memorial Meeting for Harold A. Innis.

The Acting President then introduced Professor G. Findlay Shirras, who extended greetings from the British economists.

Professor Burns proceeded to explain how the activities of the Association are carried on through the year by the functioning of its officers and Executive Committee and that our official acts are recorded in the minutes of the business meetings and of the Executive Committee. These minutes, published in the "Proceedings," were approved by a formal vote.

A review of the year's activities and financial operations was presented by Secretary-Treasurer J. W. Bell. These are given in greater detail in the reports of the Secretary, the Treasurer, the Finance Committee, and the Auditor. Particular mention was made of the transition of authority and responsibility necessitated by the untimely and lamented death of President Innis, the shift of the managing editorship of the *American Economic Review* from Professor Paul T. Homan to Bernard F. Haley, and the change of our book publishing from The Blakiston Company to Richard D. Irwin, Inc. Our relationships with other constituents of the Allied Social Science Associations were described and our future meeting places outlined.

After paying a felicitous tribute to his predecessor, Paul T. Homan, Professor Bernard F. Haley referred to the task of moving the editorial offices of the *American Economic Review* from Los Angeles to Stanford and described the work of the office and of the Editorial Board since taking over in April. The contents of Volume XLII, costs, and budget for 1953 are treated in the Managing Editor's Report.

Each year an effort is made to include brief reports from the chairmen of selected committees. Professor Gottfried Haberler reviewed the three-year history of the International Economic Association and outlined its program for conference and council meetings for the ensuing year. Professor Howard R. Bowen described the project on graduate training in economics, which is nearing completion and which will take the form of a published report. Unfortunately, time limitations precluded hearing reports of our many active committees, but the status of their work is given in their reports in the "Proceedings."

Reports of the officers, committees, and council representatives are printed in the "Proceedings" below as follows: Reports of the Secretary (page 558); Treasurer (page 575); Finance Committee (page 579); Auditor (page 581); Managing Editor (page 587); of the Committee on Publications, Norman S. Buchanan, Chairman (page 589); and of our representatives to the Social Science Research Council (page 590), the American Council of Learned Societies (page 593), and the National Bureau of Economic Research (page 595).

The outstanding feature of the meeting was the simple but impressive award of the Francis A. Walker Medal to John Maurice Clark. This is only the second time this medal has been awarded and by fortuitous circumstance it fell to the lot of a colleague and close associate to make the presentation. Professor Arthur F. Burns's citation reads as follows:

I am happy to announce that the Francis A. Walker medalist is a distinguished pioneer in the designing and construction of bridges between economic statics and economic dynamics; a political economist who has freely crossed the boundary lines of economics in his endeavors to forge policies that harmonize with man's ethical impulses as well as with his material drives; a practical scholar who has clarified thinking about economic fluctuations by enunciating the acceleration principle, exploring the multiplier process, and unraveling some of the strategic factors in business cycles; an economist theorist who at an early age glimpsed the significance of overhead costs in our highly industrialized society and whose later studies of industrial organization led him to the vital concept of workable competition; this American economist, John Maurice Clark, Professor at Columbia University, has in the course of his life made a contribution of the highest distinction to economics.

As your colleague and former student, Professor Clark, may I say that I take a very special pleasure in presenting to you the foremost prize within the power of our society to award.

Professor J. M. Clark, much touched by the honor, was prompted to make a spontaneous response—a response which was at the same time a graceful, simple, and sincere acknowledgment of the highest honor we can bestow upon a fellow economist.

An account of the inauguration of this and the John Bates Clark awards, together with facsimiles of the medallions, may be found in the frontispiece of the May, 1948, *Papers and Proceedings* (pages x-xiii).

The report of the Election Committee and the certification of the election of new officers for the year 1953 were presented by the Secretary as follows:

In accordance with the bylaws on election procedure, I hereby certify the results of the recent balloting and present the reports of the Nominating Committee and the Committee on Elections.

The Nominating Committee, consisting of Frank H. Knight, University of Chicago, Chairman, Frank A. Knox, Queen's University, Anne Bezanson, University of Pennsylvania, Donald H. Wallace, Princeton University, George H. Hildebrand, University of California at Los Angeles, and Clair Wilcox, Swarthmore College, presented to the Secretary the list of nominees for the respective offices:

For President  
Calvin Bryce Hoover

For Vice-Presidents

Eveline M. Burns  
Arthur H. Cole  
Paul T. Ellsworth  
George W. Taylor

For Executive Committee

Mandell M. Bober  
Gerhard Colm  
Edwin B. George  
David McCord Wright

The Committee on Elections (Donald S. Warning, Standard Oil Company, Chairman, Harold W. Torgerson, Northwestern University, and James Washington Bell, Northwestern University) prepared biographical sketches of the candidates and ballots were distributed early in November. The canvass of ballots was made on December 16, 1952, and the results were filed with the Secretary.

From the report of the Committee on Elections, I have the following information:

Number of envelopes without names for identification .....	37
Number received too late .....	56
Number of defective ballots .....	—
Number of legal ballots .....	2,659
Number of returns from mail ballot .....	2,752

On the basis of the canvass of the votes cast, I certify that the following persons have been duly elected to the respective offices:

- President (for a term of one year)
  - Calvin Bryce Hoover
- Vice-Presidents (for a term of one year)
  - Eveline M. Burns
  - Paul T. Ellsworth
- Members of the Executive Committee (for a term of three years)
  - Gerhard Colm
  - David McCord Wright

Upon the announcement of the results of the election, the President, Calvin Bryce Hoover, was introduced by the retiring Acting President Arthur F. Burns. President Hoover's response was a brief and sincere account of the emotions he felt upon being informed of his nomination, the interest with which he has followed Association activities since, and an insight into future plans now that the next program becomes his responsibility.

No new business was introduced, perhaps because of the lateness of the hour and the agreeable note upon which to end the meeting. President Hoover called for the final order of business, which was the reading of the following report of the Resolutions Committee by Professor Richard Ruggles.

Your Committee on Resolutions recommends the following:

The Association expresses its appreciation to the late President Harold A. Innis and to Senior Vice-President Arthur F. Burns, who have assumed major responsibility for the formulation of our program, and to those who participated in it.

The Association thanks the Local Arrangements Committee, so ably chairmanned by Mr. Robert T. Glidden, assisted by Mr. George K. Tomes, for untiring and conscientious work in organizing our meeting.

The Association acknowledges the assistance of Leverett S. Lyon and his staff in the Chicago Association of Commerce and Industry.

Acknowledgment is also made to the other professional groups meeting simultaneously in Chicago, for their co-operation in producing the joint program of annual meetings and for sharing their interesting programs. The student volunteers, the Chicago Convention Bureau, and the personnel of the Conrad Hilton Hotel were particularly helpful in making the meetings successful.

Finally, the Association extends its sincere thanks to Professor James Washington Bell, conscientious and capable Secretary of the Association, and to his staff.

John C. Clendenin, *Chairman*  
 Captain William McKee  
 Richard Ruggles

The meeting adjourned at 6:20 P.M.

JAMES WASHINGTON BELL, *Secretary*

## REPORT OF THE SECRETARY FOR THE YEAR 1952

### MINUTES OF EXECUTIVE COMMITTEE

The first part of the Secretary's report consists of the minutes of the Executive Committee meetings, which, together with the minutes of the Annual Business Meeting, provide a record of official acts and activities of the Association; the second part is a brief summary of the year's operations with comments and interpretations.

1. Minutes of the second meeting of the 1952 Executive Committee, held at Arden House, Harriman Campus of Columbia University, New York, April 3-5, 1952 (for minutes for the first meeting, see *Papers and Proceedings*, May, 1952, pages 716-719):

The second meeting of the 1952 Executive Committee was held April 3-5, 1952, at Arden House, Harriman Campus, Columbia University. The following were present: A. F. Burns, presiding, J. W. Bell, Secretary-Treasurer, K. E. Boulding, J. B. Condliffe, H. S. Ellis, R. A. Gordon, B. F. Haley, A. G. Hart, F. H. Knight, W. W. Leontief, and L. G. Reynolds. Absent were: H. A. Innis, L. V. Chandler, and J. H. Williams. Attending as members of the Nominating Committee were Anne Bezanson, G. H. Hildebrand, F. A. Knox, D. H. Wallace, and Clair Wilcox, and as a guest, J. F. Wellemeyer, of the staff of the American Council of Learned Societies.

1. *Minutes*. The minutes of the Boston meetings of December 26 and 29, 1951, were reviewed and were approved with minor corrections as printed in galley proof.

2. *President's Remarks*. In the absence of Professor H. A. Innis, who was unable to attend on account of illness, Professor A. F. Burns presided over the meetings.

3. *Report of the Secretary* (J. W. Bell). A brief summary was presented of events transpiring in the Secretary's Office since the December meetings, such as up-to-date figures for membership, publications, information booklet, use of mailing list, representatives on various occasions, and annual meetings (see Item 8b).

It was VOTED to authorize the publication of the papers presented at the transportation and public utilities sessions of the 1951 annual meeting as Part II of the *Papers and Proceedings*, to be issued with the June or the September number of the *Review* or at the discretion of the Secretary, who as Editor of the *Papers and Proceedings* is responsible for making arrangements with the printers. The following resolution was VOTED:

That the Executive Committee reaffirms its minute of December 30, 1948 (see "Proceedings," May, 1949, page 487, Item 7a). It understands this minute to mean that the American Economic Association is a unitary organization, with no provision for sectional groupings, and that the annual program is arranged by the President with the aid, if he so chooses, of a program committee. Over the course of several years, successive presidents have aimed to give suitable representation upon the programs to all significant fields within the broad field of economics. Whatever assistance the President may seek in arranging the program, he should in no sense be obligated to accept the formulation of any part of it by a self-constituted sectional group. Announcement of the program and publication of the proceedings by the Association is to be confined to the program as arranged by the President.

The Secretary reported that Professor P. T. Homan had been invited to attend the meeting and had intended to come but was unable to do so, his plane having been grounded at the last minute. It was VOTED to authorize the Secretary to write a letter to the President of the University of California, expressing our appreciation and thanks for housing the Editorial Office for the past year and a half.

4. *Report of the Treasurer and the Finance Committee* (J. W. Bell). The financial status of the Association was briefly outlined; e.g., bank balances, current sources of income and our expenses, status of foundation funds, and the financial results of the annual meeting at Boston. Our investment account was also reviewed.

5. *Report of the Managing Editor* (B. F. Haley). The following minute, drafted in accordance with the vote of December 26, 1951, was approved:

The Executive Committee took cognizance of Paul T. Homan's retirement, effective April



1, 1952, as Managing Editor of the *American Economic Review*. During the eleven years of his editorship, Professor Homan had built up the *American Economic Review* until it is now accepted on all sides as a leading economic journal in the United States. While he has had the assistance of a succession of able boards of editors, for the selection of which he must also be given credit, the high level which the *Review* maintained must be considered very largely his own personal achievement.

The Executive Committee views his retirement with regret and recommends that a suitable statement of the Committee's appreciation be published in the June, 1952, issue of the *American Economic Review*.

It was VOTED to confer a complimentary membership on P. T. Homan.

On recommendation of Professor Haley, it was voted to approve a new schedule of contributors honoraria. The new scale changes the previous practice of paying \$2.50 per page to \$3.50, with a maximum payment of \$50.00 (compared to the former figure of \$35.00), and from 6 cents a line to 7½ cents a line for Communications and book reviews, with a minimum payment of \$5.00 for any one contribution. This change will involve an estimated \$800.00 additional cost per year.

6. *Reports of Standing Committees.*

6a) *Publications* (N. S. Buchanan). In accordance with the authorized power to act (minute of December 26-29, 1951, Item 6a), the Secretary presented for approval a contract with Richard D. Irwin, Inc. The Secretary explained that the provisions of this contract virtually shifted the arrangements which had existed between the Association and The Blakiston Company to the Irwin concern and that the transition was being effected expeditiously and with no delay in our publishing program. An announcement of this transition appears in the March number of the *Review*. It was VOTED to approve the Irwin contract.

In the "Reading Series," the publication of Volume VI, on *Price Theory*, is announced for mid-April.

The volume of *Enterprise and Secular Change*, co-sponsored by our Association and the Economic History Association, is nearing completion, but a final contract is being held up until the manuscript can be examined by the publisher for estimates on cost. These costs and the size of the edition will aid in the determination of the sharing of royalties.

Professor Haley reported that the manuscript for *Survey*, Volume II, is in the hands of the printers.

The Secretary reported that the Walras volume of the "Translation Series" is virtually complete and that we are again corresponding with Allen & Unwin (who have taken over the same relationship with Irwin for the distribution of our publications as they had with Blakiston) in order to explore further the feasibility of setting type for this volume abroad. Progress is also being made in working out an arrangement with the Royal Economic Society as a co-sponsor of this volume.

Professor Boulding submitted a proposal on the publication of a bibliography on economic theory. This proposal was referred to the Research Committee for their consideration.

6b) *Research* (S. E. Leland). The constitution of this Committee has become somewhat indefinite. After reviewing the functions of this Committee and of the Publications Committee, it was VOTED to merge the two and to constitute the membership of the new Committee on Research and Publications as follows:

Ex Officio: The three representatives to the Social Science Research Council and one representative to the National Bureau of Economic Research and the Secretary.

Appointed by the President: Three members, on a rotating tenure, the first appointments being made: one for one year, one for two years, and one for three years.

The President is to designate one of the above as chairman for a three-year term. This change is to become effective January 1, 1953.

6c) *Public Issues* (S. H. Slichter). No formal report has been received from this Committee, as envisaged in the minute 6c, December, 1951, but a communication was read by the Secretary from Professor Paul McCracken, Chairman of the Subcommittee on International Economic Problems. It was VOTED to dissolve the Committee on Public Issues, with thanks, and to authorize the appointment of an *ad hoc* committee to survey the problem of reconstituting such a committee. Some observations on the scope and activity of the Committee may be found in the concluding section of the report on economic instability. A report presenting the case for and against the existence of a committee on public issues will be expected at the December meeting.

6d) *International Co-operation; the I.E.A.* (Gottfried Haberler). A full report of the activities of this Committee and the status of the International Economic Association will be presented at the December meeting. Professors A. F. Burns and R. A. Gordon indicated

their intention of attending the business cycle session which is to be held at Oxford University early in September.

6e) *Honors and Awards* (I. L. Sharfman). In the absence of Professor Sharfman, the Secretary submitted this Committee's report and the sealed preferential ballots of the Committee's members. No new candidates having been presented by members of the Executive Committee, the balloting proceeded on the nominees for the Francis A. Walker Medal. The award will be made with appropriate ceremony at the 1952 annual meeting.

As successors to Professors Sharfman and Hoover, whose terms on the Committee expire at the end of this year, Professors E. S. Mason and J. J. Spengler were elected for the usual term of six years. When the new Committee is constituted in January of 1953, N. S. Buchanan is to succeed to the chairmanship.

6f) *Foreign Honorary Members*. This Committee, having been discharged, with thanks, in December, has not yet been reconstituted. A list of names was discussed and the Secretary was instructed to submit the names to President Innis as suggestions for his consideration.

6g) *Academic Freedom* (F. C. Mills). The report of this Committee was read, and after due consideration, it was VOTED to accept the report, discharge the Committee, with thanks, and to constitute an *ad hoc* committee on "Freedom of Teaching, Research, and Publication in Economics," which is asked to draw up a statement formulating the functions of such a committee, to explore a "pilot" case to test out operations, and to submit a report at the December meeting.

6h) *Graduate Training in Economics* (H. R. Bowen). A letter from Professor Bowen was read which described the progress made on the investigation to date. Progress is on schedule and the report will probably be completed as anticipated sometime this fall.

6i) *Nominations* (F. H. Knight). After dinner on Friday, the members of the Nominating Committee (Anne Bezanson, G. H. Hildebrand, F. A. Knox, D. H. Wallace, and Clair Wilcox) convened with the Executive Committee to consider nominations for the President of the Association for 1953. After discussion of the names submitted, there being no new names added, members of the Electoral College proceeded to ballot for the office of President. They selected the nominee and acceptance was received by telephone. The rest of the panel submitted by the Nominating Committee was discussed and it was VOTED that the slate be published in the June number of the *Review* as follows:

President: Calvin B. Hoover

Vice-Presidents: Eveline M. Burns, Arthur H. Cole, Paul T. Ellsworth, George W. Taylor

Executive Committee: Mandell M. Bober, Gerhard Colm, Edwin B. George, David M. Wright

Professor J. P. Miller was elected to succeed H. A. Innis as representative to the Social Science Research Council. Professor Innis' term expires at the end of this calendar year.

#### 7. *Reports of Council Representatives.*

7a) *A.C.L.S.* (F. H. Knight). Brief oral reports on the activities of the A.C.L.S. were made by Professors Knight and Bell. The Committee also listened with interest to a report by Dr. J. F. Wellemeyer on the National Roster in the Humanities and the Social Sciences, which project is being conducted under A.C.L.S. auspices. Dr. Wellemeyer also described the work on the Commission on Human Resources and Advanced Training and of the activities of the Federal Security Agency, Office of Education, on personnel surveys.

7b) *S.S.R.C.* (T. W. Schultz). No report was submitted on the activities of the S.S.R.C., but a general discussion ensued on the recruitment of personnel by the sciences and concern was expressed about the lack of funds needed to train graduate students in the social sciences. It was VOTED to refer to the Research Committee the following matters:

(1) To re-examine our relations with the councils.

(2) To urge on the councils a fellowship expansion program, with suggestions on more flexible ways of allocating fellowships and a protest on the insistence by the foundations (including the Ford Foundation) upon innovations, thus diverting the activities of scholars to sidelines which would not otherwise be attractive to them.

(3) To consult with others on the general problem of foundation support for the recruitment of scholars in the field of the social sciences and the humanities.

7c) *N.B.E.R.* (D. H. Wallace). A brief oral report by Professor Wallace was supplemented by a few remarks from Professor Burns.

8. *Annual Meeting*. The tentative dates set for the December meetings—December 27-29, 1952—seemed generally satisfactory.

On account of the increasing pressure for a decision on the 1954 meeting place, the following proposals were considered and acted upon:

a) It was VOTED to decline the invitation from the American Statistical Association to meet jointly in Montreal, September 10-13, 1954.

b) It was VOTED to co-operate with Section K of the A.A.A.S. and the Western Economic Association in a meeting to be held in San Francisco sometime in the summer of 1954.

c) It was VOTED to hold a Christmas meeting in Toronto in 1954.

#### 9. Miscellaneous.

9a) *Joint Council on Economic Education.* An invitation from the Council to the A.E.A. to participate in a program of training teachers to teach economics was discussed at length and it was VOTED to authorize the Secretary to accept membership on the Commission on Economics in Teacher Education and in the light of this experience to report on the desirability of further co-operation.

9b) *United States Armed Forces Institute Panel.* It was VOTED to authorize the Secretary to prepare a panel of names of economists to aid the United States Armed Forces Institute in the selection of text materials in economics.

10. *Program for the 1952 Meetings.* The remaining time of the meeting was devoted to the discussion of the program for the 1952 meeting.

## 2. Minutes of the Christmas meetings held in Chicago, December 27 and 29, 1952:

The *third meeting* of the 1952 *Executive Committee* was held at the Conrad Hilton Hotel, Chicago, December 27, 1952, Acting President A. F. Burns, presiding. Others present were: J. W. Bell, K. E. Boulding, L. V. Chandler, J. B. Condliffe, H. S. Ellis, B. F. Haley, F. H. Knight, W. W. Leontief, L. G. Reynolds, and J. H. Williams. Absent were: R. A. Gordon and A. G. Hart. Also attending, as guests, were Gerhard Colm, D. M. Wright, and C. B. Hoover.

The first meeting of the 1953 *Executive Committee* was held on December 29, with the following members present: President C. B. Hoover, presiding, J. W. Bell, K. E. Boulding, A. F. Burns, Gerhard Colm, J. B. Condliffe, P. T. Ellsworth, B. F. Haley, F. H. Knight, L. G. Reynolds, J. H. Williams, and D. M. Wright. Absent were: E. M. Burns and A. G. Hart. Attending, as guests, were: J. M. Clark, F. S. Deibler, H. S. Ellis, Gottfried Haberer, S. E. Leland, and W. F. Wilcox.

The account of the proceedings given below does not follow the chronological order of business but treats the sequence of items as they were listed on the agenda.

1. *President's Remarks* (Acting President A. F. Burns). The meeting was called to order after we had partially recovered from the shock of the sudden and fatal collapse of our guest speaker, the Honorable William Clifford Clark, Deputy Minister of Finance of the Dominion of Canada.

After giving an account of the events prior to the death of President H. A. Innis and of the procedure followed in effecting a succession by Vice-President A. F. Burns to the responsibilities and duties of that office, an order of business was adopted which would enable us to complete the essential business of the year in the last meeting of the 1952 *Executive Committee*. Continuing and new business was postponed to the first meeting of the new Committee.

2. *Minutes.* The minutes of the meeting held at Arden House in April, 1952, distributed in mimeographed form, were approved with minor corrections. It was suggested that the minutes of the spring meeting be printed in the June number of the *American Economic Review* hereafter. No action was taken but this practice may be initiated if it proves to be feasible. By VOTE, H. S. Ellis was invited to continue to serve as a member of the *Executive Committee* for another year in view of the vacancy caused by the death of H. A. Innis. A question of the constitutionality of this act was raised and the matter was laid on the table for consideration at the April meeting.

3 and 4. *Reports of the Secretary-Treasurer, the Finance Committee, and the Auditor* (J. W. Bell). A résumé of the year's activities was presented; i.e., meetings, membership, publications, committee operations, special projects, representatives' reports of council activities, etc. Some of these topics were discussed and acted upon en route.

The financial status of the Association was discussed, with the aid of summary statements of income and expenses and asset-liability balance sheets. No analysis was made of our investment holdings, but the results of the year were summarized. A copy of the Auditor's Report was circulated. A detailed account of financial and investment operations may be found in the reports of the Treasurer, the Finance Committee, and the Auditor, whereas the Secretary's Report covers other activities.

The present members of the Finance Committee (Roy C. Osgood, Wells Farnham, and J. W. Bell, ex officio) were re-elected for another term, as was the auditor, David Himelblau, with a VOTE of appreciation to the former, who have so effectively safeguarded and augmented the Association's funds, and to the latter, who has gone over our books with painstaking care and has helped us to keep our accounts straight.

The three-year terms for both the Secretary-Treasurer and the Counsel having expired, it was VOTED to extend to J. W. Bell and John E. Walker an expression of appreciation for their services to the Association and both were re-elected to serve another term.

5. *Report of the Managing Editor* (B. F. Haley). After reading his report (see below), Professor Haley commented on the size and cost of the *Review*, the effect of the new scale of payments for contributions and reviews, and increased printing costs. He pointed out that the proposed budget figures for 1953 do not allow for such contingencies and not much allowance is made for growth in the size of the printing. A budget of \$37,650 was approved by formal VOTE. To succeed Professors Moses Abramovitz and William Fellner, whose terms on the Editorial Board expire this year (1952), Professors Ragnar Nurkse and Raymond F. Mikesell were appointed, with consent of the Executive Committee.

#### 6. *Committee Reports.*

6a) *Committee on Publications* (N. S. Buchanan). In the absence of Professor Buchanan (whose report is printed below), a brief account was given by Professor Bell of (a) the republication series, (b) the *Survey of Contemporary Economics*, Volume II, and (c) the Walras volume of the "Translation Series." The shift from Blakiston to Irwin was described and figures were presented on sales and inventory of the "Readings Series" and the two *Survey* volumes. A report to the Carnegie Corporation on *Survey*, Volume II, dated August 1, 1952, prepared by B. F. Haley and J. W. Bell, was read. A consolidated report showing the financial results and present status of the "Readings Series" and the *Surveys* publication was called for and will be prepared for the April meeting. Final arrangements with the publishers for the production of Professor Jaffe's translation of Walras have virtually been completed. We are awaiting the receipt of a contract to sign with George Allen & Unwin, Ltd.

6b) *Committee on Research* (S. E. Leland). The Committee was in session during the Saturday meeting of the Executive Committee, so Professor Leland reported on the activities at the Monday meeting. Four points were made: (1) a new volume in the "Readings Series" on the analysis of research techniques is being considered; the translation of Pareto's *Cours ou Manuel* may be recommended next if the Walras volume is well accepted; (3) consideration is being given to a proposal that a subcommittee on bibliography be appointed to study projects; e.g., K. E. Boulding's economic theory bibliography, social science or economic abstracts, domestic and foreign; (4) the Committee is working on a report on foundations and our relation to councils, etc.

In accordance with action taken at the April meeting, the reconstituted, merged Committee on Research and Publications becomes effective January 1, 1953, with the composition as follows:

#### Ex officio

Social Science Research Council

- (1) T. W. Schultz
- (2) G. W. Stocking
- (3) J. P. Miller, Chairman
- (4) D. H. Wallace
- (5) J. W. Bell

National Bureau of Economic Research  
Secretary

#### Appointed by President

For one-year term

For two-year term

For three-year term

- (6) S. E. Leland
- (7) J. J. Spengler
- (8) Jacob Marschak

It was VOTED to continue the appropriated, unexpended balance (\$547) for the use of this Committee.

6c) *Ad Hoc Committee on Public Issues* (D. H. Wallace). A letter from Professor Wallace stated that the delay in setting up this *ad hoc* committee after the parent committee had been discharged had not made a meeting possible. It was VOTED to appropriate the amount of \$150 to finance a meeting of this Committee sometime before April. The Committee has been reconstituted as follows: D. H. Wallace, Chairman, F. C. Mills, E. S. Mason, H. M. Groves, and D. M. Keezer.

6d) *Committee on International Co-operation; the I.E.A.* (Gottfried Haberler). A rather complete history of the three-year old International Economic Association was given



by Professor Haberler at a meeting of the Committee and also at the Business Meeting. A three-point proposal was proposed and discussed; namely: (a) that the American Economic Association continue its support of the I.E.A. as in the past; (b) that we hear a report at the April meeting on ways and means of co-ordinating the interests and activities of the American and the International Associations; and (c) that the I.E.A. approach the Ford Foundation for a 3-5 year grant, with A.E.A. approval.

It was VOTED to pay double dues (i.e., \$400) again in 1953.

The three-year term of two of our representatives to the I.E.A. conference expired in 1952; viz., J. H. Williams and J. V. Van Sickle. The terms of the other two delegates, Gottfried Haberler and H. S. Ellis, run through 1955. (Replacements will be made by presidential appointment from members who are likely to be in Europe at the time of the conference, since their travel expenses cannot be assumed by the Association.)

6e) *Committee on Honors and Awards* (N. S. Buchanan). A report from this Committee will be due in April, since recommendations for the award in 1953 of the J. B. Clark Medal will be in order.

6f) *Committee on Foreign Honorary Members*. Untoward events prevented the reconstitution of this committee, which now becomes the responsibility of the present administration. In due course a new committee will be expected to review old panels and construct new ones with reference to specifications found in the Secretary's Report in the *Papers and Proceedings*, May, 1952, page 723; in the Willits report, *Papers and Proceedings*, 1945, page 493; and in the Nourse report, *Papers and Proceedings*, May, 1946, page 908.

6g) *Ad Hoc Committee on Freedom of Teaching, Research, and Publication in Economics* (T. W. Schultz). This Committee was constituted too late to function this year. Action taken at the April, 1952, meeting was reaffirmed and a report was called for to be presented, if possible, at the spring meeting of the Executive Committee.

6h) *Ad Hoc Committee on Graduate Training in Economics* (H. R. Bowen). Professor Bowen was unable to attend the Executive Committee meeting but he did present a report on the history and progress of the survey project financed by the Rockefeller Foundation, and he has submitted a draft of his findings to the members of his advisory committee (G. L. Bach, Milton Friedman, I. L. Sharfman, and J. J. Spengler). A copy of the report was circulated among those present by J. W. Bell and a financial accounting of the Rockefeller Foundation grant was read. The following procedure was VOTED: (1) to accept the report on graduate training in economics if it is approved for publication by the advisory committee; (2) that the President and Managing Editor act for the Executive Committee, if necessary, to prescribe the length and form of the report for publication; (3) that the Director (H. R. Bowen) be asked to prepare an article of modest length describing the project and findings for the *American Economic Review*; and (4) that the Executive Committee, after studying the recommendations of the *ad hoc* advisory committee, pass a resolution prescribing the form and medium of publication at the April meeting; i.e., whether to issue it as a supplement to the *American Economic Review* and, if so, at a price or gratis to all members (and subscribers); or to farm it out to some commercial publisher. The unexpended balance of the Rockefeller Foundation grant (\$2,000-plus), plus the \$2,000 originally allocated to the project by the American Economic Association, would about cover the cost of publishing a 175-page report as a supplement to the *Review*.

A letter from Professor Bowen stated that Professor I. L. Sharfman would be unable to give the report his immediate attention and it was left to President Hoover to appoint, at his discretion, a substitute member to serve in an advisory capacity.

6i) *Nominating Committee* (J. H. Williams). President C. B. Hoover appointed J. H. Williams as Chairman of this Committee, and during the meetings some progress was made in selecting the other five members. Essential information is being supplied which will be useful to the Committee in its work; e.g., lists of former officers, nominees, members of nominating committees, write-ins, and suggestions received and reviewed by the Elections Committee. The Nominating Committee reports at the spring meeting and, together with the Executive Committee, forms the Electoral College which selects the nominee for next year's president.

6j) *Committee on Elections* (D. S. Warning). The report of this Committee was read by the Secretary at the annual business meeting. We are grateful to D. S. Warning and H. W. Torgerson, who, with the Secretary, aided in preparing the ballots and biographical sketches and verifying the ballot count.

7. *Reports from Council Representatives*. Reports were received from F. H. Knight, our representative to the American Council of Learned Societies, and from G. W. Stocking, for



the Social Science Research Council. Professor D. H. Wallace's report on the activities of the National Bureau of Economic Research will be found printed below. These reports will be discussed at the April meeting of the Executive Committee.

8. *Annual Meeting.* Mr. R. T. Glidden, of International Harvester Company, Chairman of the Local Arrangements Committee, was introduced to the members of the Executive Committee. Few of us realize the work and sacrifice involved in planning, organizing, and managing a convention of the size and complicated character ours has grown to be. Only a capable staff experienced in special functions and operations can perform with such smoothness and precision. Mr. Glidden and his associates deserve more credit than the recognition given them in any formal statement, whether drafted by us or by a Resolutions Committee at the annual business meeting. We trust that they have found the experience rewarding in the sense of satisfaction in doing a difficult and useful job well—extremely well. This sentiment applies also to their predecessors; i.e., those who have participated in performing like functions at previous meetings in Boston, Chicago, New York City, Cleveland, and elsewhere, where we have met in the past. We are deeply indebted to the many members who have made the physical arrangements for our meetings. From many professional convention managers we have heard it said that our meetings, programs, exhibits, etc., are conducted as smoothly and efficiently and more economically than those of most commercial organizations. This should be a gratifying tribute to those who are willing, without pecuniary compensation, to work in the interests of our profession.

At a breakfast meeting of the secretaries of the Allied Social Science Associations, our joint and separate meeting plans were reviewed. It was decided that we continue the present scheme of holding all-out joint sessions every third year, with independently arranged meetings in the intervening two years. Since 1949, this arrangement has not worked unsatisfactorily, although the two types of meetings differ little in their character. Several associations have selected other times than the Christmas season to hold their main meetings, and this has served to relieve the pressure on hotel facilities and program pressure. Opinions differ somewhat with respect to formalization of the intersociety organization, but most of us feel that arrangements holding the allied social science group together should be kept informal and flexible.

Our present schedule is to meet in Washington, D.C. (Hotel Statler) in 1953 (December 28-30), Detroit (Hotel Statler), with token sponsorship of a Western meeting, in 1954, and New York City (Commodore Hotel) in 1955. No commitments have yet been made for future years, although we are thinking of Cleveland (Hotel Cleveland) for 1956, Atlantic City (Chalfonte-Haddon Hall) for 1957, and Chicago (Conrad Hilton) for 1958. In some respects, it is unfortunate that we have to plan so far ahead, but with limited facilities available for large meetings, this precaution seems to be necessary.

9. *Miscellaneous Business.*

9a) *Commission on Economics in Teacher Education.* In conformity with action taken at the April, 1952, meeting, the Secretary accepted membership in the Commission on Economics in Teacher Education and attended an exploratory meeting held in New York City on May 23, 1952. Representatives from the Joint Council on Economic Education and the American Association of Colleges for Teacher Education were present and plans were made for organizing the Commission and formulating its purposes and functions. A second meeting of the Commission was held at Riverdale, New York, August 29-30. Your Secretary was unable to attend but reports were received from G. Derwood Baker, Horace Taylor, B. W. Lewis, and Laurence Leamer. Further progress has since been made and three specific subcommittee projects are under way. In view of these developments and because we see a definite professional responsibility in participating in a promising enterprise which supplements and is complementary to our previous and present endeavors in this field of economic education, it was recommended that the A.E.A. appoint an official Committee on Economics in Teacher Education. It was VOTED to approve this recommendation. The following members have been appointed: B. W. Lewis, Chairman, Horace Taylor, and Archibald McIsaac.

9b) *Fulbright Screening Committee.* The following members of the Association served this past year on the Fulbright Screening Committee: B. W. Lewis, Chairman, G. W. Stocking, T. H. Carroll, R. A. Lester, C. F. Remer and J. W. Bell. This is not a committee of the Association.

9c) *The Metropolitan Economic Association of New York.* This regional group has applied for recognition of their status as an affiliate of the American Economic Association. They have been informed that the A.E.A. is not so organized and that we cannot recognize them as such, though we follow their activities with interest and will aid them in every way possible through our Secretary's office.

9d) *BLS—Consumer Price Index Project.* At the request of Commissioner Ewan Clague, we have co-operated in finding an appropriate participant in this Department of Labor project. Dr. Ruth Mack has been appointed as an adviser.

10. *New Business.*

10a) It was VOTED to hold the spring meeting of the Executive Committee on April 3-4, 1953, if suitable arrangements can be made for that date. The Biltmore Hotel, New York City, was suggested as an appropriate place.

10b) *The 1953 Meeting.* President C. B. Hoover announced that he would prepare a memo incorporating suggestions for the 1953 program, to be distributed at the April meeting.

### ACTIVITIES AND OPERATIONS

Little did any of us realize a year ago that our newly elected president was so soon to be stricken by a malady which necessitated a major operation and which on November 8 of this year caused his untimely death. On the eve of the spring meeting of the Executive Committee, we learned of this serious illness and it became necessary for our able senior Vice-President, Arthur F. Burns, first to take over the duties of chairman of the Executive Committee and eventually the responsibilities of acting president of the Association. Throughout this period, the Secretary kept Professor Burns informed of all consequential matters affecting the welfare of the Association, and in October a fortuitous trip to New York City with a stopover in Toronto enabled the Secretary to learn in detail what gaps still remained to be filled in program and other matters and to help in making the necessary transition effective. Especial recognition is due Mrs. Jane Ward, secretary to Harold A. Innis, for her conscientious and intelligent efforts to keep Association affairs running smoothly.

Another transition which was effected with frictionless facility was the shift of the editorial office of the *American Economic Review* from Los Angeles to Stanford. In large part, this was due to the sharing of mutual understandings by Professors Bernard F. Haley and Paul T. Homan and to the fortunate circumstance that Miss Doris Merriam was able and willing to continue as assistant to the Managing Editor.

Still another change which marked this year's events was the quick and effective substitution of Richard D. Irwin, Inc., for The Blakiston Company as publishers of our "Readings," "Survey," and "Translation" series. Our relationships with Blakiston had been satisfactory in every respect, but the merger of Blakiston with Doubleday & Company and the latter's decision to concentrate their interests in other fields, made it necessary to establish relations with another publisher. Fortunately, the progressive and successful head of Richard D. Irwin, Inc., was willing and anxious to extend and develop the economic items in its list of publications and we have entered into agreements with that firm on substantially the same terms as we enjoyed with Blakiston. We consider it a notable achievement that Richard D. Irwin, Inc., was able to take over commitments in force with Blakiston without loss of time or materials. Volumes in process have been completed and others will appear on schedule and in some cases even earlier and at lower cost than we had expected.

*Annual Meetings.* In years past, down to 1949, it became a customary practice for the growing number of associations in the field of the social sciences to hold their annual meetings at the same time and place with joint or separate

sessions which were arranged with little regard to any over-all plans. In order to minimize duplication of effort and conflict of interests in programming sessions and determining publication outlets for papers, it was agreed by representatives of the Allied Social Science Associations (see description of terms in minutes of the Business Meeting of December 29, 1949) that, beginning with an all-out jointly arranged meeting in New York City in 1949, we would schedule such meetings every third year. In the intervening two years, it was agreed that each association would follow its own interests, i.e., the interests of its own membership, in choosing the time and place of meeting and of programming. A cycle has now been completed under these arrangements and the results, though not unsatisfactory, have not been precisely what was expected. Several associations, e.g., American Political Science Association, American Sociological Society, American Farm Economic Association, Economic History Association, Econometric Society, American Marketing Association, and the American Accounting Association, have become satisfied with their experience in holding main meetings at other times of the year than during the Christmas season, and the problem of unwieldiness has in large part been solved. So-called "independent" meetings have been hardly less "joint" than the over-all joint meetings, and this year's joint meeting differs little if any from the past two years' separately planned meetings. A conference of representatives of the Allied Social Science Associations is being held during the meetings this year to review our experience during this experimental period, with a view to renewing or revising our plans for future meetings at the end of the current cycle, which contemplates separately arranged meetings in 1953 (Washington, D.C.) and 1954 (Detroit) for the American Economic Association and joint in 1955 (New York City).

This year we meet at the Conrad Hilton Hotel in Chicago, at which facilities are quite adequate to serve the American Finance Association, the Industrial Relations Research Association, and Econometric Society as well. The American Statistical Association and others have their headquarters at the Palmer House and joint sessions are arranged to be held in both hotels. This situation we consider quite satisfactory.

Twenty sessions have been arranged in our program and we are assuming responsibility for the publication of the papers presented at sixteen of them, as well as abstracts of two transportation and public utility sessions.

*Membership.* This year we passed the 10,000 mark in number of our mailing list. We now have over 7,200 members and 2,725 subscribers—an increase of 262 over last year. Exhibit II of the Secretary's Report shows the breakdown of members by classes and changes occurring during the year. Figures for past years, 1886 to 1948, are charted in a diagram published on page 314 of the 1948 *Directory*. Ever since World War I, the growth has been steady, except in 1926, 1931, 1932, and 1933, at a rate of nearly 300 per year. We can reasonably expect this increase to continue, if for no other reason than the fact that more formally trained economists are being prepared at institutions of higher learning and the increased interest in economics in business, government, and other professional fields. The latest count of teachers of economics, compiled by a group of publishers (as of August 4, 1952), amounted to 6,714

names (which compares with 4,003 in economics, 1,085 in economics and social science, and 887 in social science in general, a total of 5,975, as of February 1, 1950) (see the May, 1951, *Papers and Proceedings*, page 769).

Rate of growth can be accelerated at any time by resorting to (1) publishers' list of professors, (2) National Registration list, (3) results of the questionnaire sent out by the Commission on Human Resources and Advanced Training, and (4) the data collected by the Federal Security Agency, Office of Education. But such work requires much clerical help.

We now print an edition of 10,800 copies of our publications—an increase of 400 over last year. This allows us a modest surplus of a few hundred copies to meet the demand of new members and subscribers and the sale of odd numbers. This margin is safe because we are able to buy out-of-print numbers from members who do not keep complete files and are willing to respond to our advertisements in the *American Economic Review*. Members and subscribers who wish to fill gaps in their files or who wish to dispose of copies or sets of our publications may run notices to this effect in the *Review*.

*Geographical Distribution.* No new trends are noticeable in the distribution of our members and subscribers. (See May, 1952, *Papers and Proceedings*, page 720, for brief analysis and for references to previous accounts.)

#### *Publications.*

*American Economic Review.* The four numbers of this year's volume of our journal total 1,039 pages. The edition of 10,600-10,800 copies was published at a cost of \$24,561. Details of contents, i.e., articles, communications, reviews, notes, etc., costs and budget are given in the Report of the Managing Editor. No special supplements were issued.

Permission to quote and to reprint materials from the *Review* as well as from the *Papers and Proceedings* were liberally granted (with authors' consent) whenever it was thought that the legitimate purpose of making the contents of our publications more generally accessible would be achieved.

The photographs and biographical sketches of William Z. Ripley and Harry A. Millis continue the series of past presidents started in 1941. Since 1942, the photograph of the current president has appeared, along with his presidential address, in the March issue, that of John H. Williams being added in 1952. The series may be continued to cover past editors and secretaries. Paul T. Homan's photograph appeared in the June issue.

The announcement section, "Vacancies and Applications," has run in the *American Economic Review* since 1939. This service, designed to get demand and supply factors of the market for economists together, is supplemented by the Employment Register which makes available the opportunity to those seeking positions and to those who have vacancies to fill to confer at the annual meetings. We make no recommendations, nor do we have facilities to provide files of applicants throughout the year. Our service is a simple one. A more elaborate setup would preoccupy full-time help which we are in no position to hire at this time.

Last December the Secretary was authorized to publish as Part II of the *Papers and Proceedings* the papers presented at the transportation and public utilities sessions of the 1951 annual meeting. This authorization was sought

partly because the volume of papers produced a heavy pressure on the printers during their peak-load period and partly on account of a misunderstanding about our having assumed the responsibility for publishing these papers. Fortunately, a compromise was effected and we were able, with slight delay, to get all of the papers in one volume and the two-part plan was abandoned. The *Papers and Proceedings* volume of 768 pages was issued in May. The printing costs of 10,700 copies amounted to \$13,191.

An eleven-page supplement to the 1948 *Directory*, containing names and addresses of new members added from June 1, 1951, to June 1, 1952, was prepared in the spring and mailed to all members in August. A handbook of names and addresses of all members and subscribers will be issued in 1953.

The sixteen-page information booklet was revised and distributed to officers and to prospective members and others interested in the purposes and activities of the Association.

*Committee Activities.*

*Committee on Publications* (N. S. Buchanan, Chairman).

a) *Republications Series*. Six volumes of this series, sponsored by the Association, have been issued and a Volume VII, on *Fiscal Policy* (J. K. Butters and Arthur Smithies, co-editors), is in preparation. Volume VI, on *Price Theory* (K. E. Boulding and G. J. Stigler, co-editors), was on the press when Richard D. Irwin, Inc., took over our contract from The Blakiston Company, was completed by our new publishers, and put out under their imprimatur early in 1952. The sixth volume, like the previous five, has been well received and the sales are satisfactory as reflected in the financial accounting. As indicated in last year's report, we believe that the urgency of preparing new volumes has subsided since other authors and publishers are now apparently willing to perform this service as the need arises and the Association's activities may advisedly be directed along other lines. We continue to give liberally permission to others to reprint articles and papers appearing in our publications whenever authors' permission is also granted.

The volume of readings on *Enterprise and Secular Change*, co-sponsored by the American Economic Association and the Economic History Association (F. C. Lane and J. C. Riemersma, editors), referred to in last year's report, has now been published by Richard D. Irwin, Inc. This volume, on display for the first time at the 1952 meetings, should have wide appeal to both economists and historians.

b) *A Survey of Contemporary Economics*, Volume II. This volume, edited by Bernard F. Haley and published by Richard D. Irwin, Inc., was ready for distribution in September. This volume contains ten essays reviewing vital subjects not covered in *Survey I* with an added feature; namely, critical comments on each essay by two reviewers. The preparation of future volumes in this series will depend upon the expressed need for this type of service and possibly, also, the financial support such undertakings may elicit. The first volume was our own responsibility; the second was generously underwritten by the Carnegie Corporation.

c) *Translation Series*. The work on Walras' *Elements d'Economie Pure*, by William Jaffe, has been completed, but its publication has been somewhat



delayed due to our reconsideration of publication arrangements. Arrangements have now been practically completed whereby George Allen & Unwin, Ltd., publishers, are to do the composition, print the English edition for the European market under the auspices and co-sponsorship of the Royal Economic Society, and Richard D. Irwin, Inc., are to import sheets and bind and distribute the finished volume in the American market under our auspices. We have made every effort to hold down the price of the volume within the range of the ordinary scholar's budget—with the result that through generous allowances by the publisher and real sacrifice of royalties by the author the purchaser of this volume will be the chief beneficiary.

As indicated in earlier paragraphs, Richard D. Irwin, Inc., has taken over the Blakiston contract to publish our books and we look forward to a continuation of the very satisfactory working arrangements that have had such a fine beginning.

Publication projects have been largely the work of the Research Committee. It has therefore been decided to merge the two committees and provide for a rotating membership. We hope in this manner to spread the burden, as well as the rewarding satisfaction of performing a productive service to the Association and to the profession, to a wider circle of ambitious and loyal scholars.

*Committee on Research* (S. E. Leland, Chairman). The Committee has had two meetings during the past year to consider the Association's research program and also the matters referred to it by the Executive Committee at its April meeting. The constitution of the new Committee on Research and Publication becomes effective January 1, 1953.

*Committee on Public Issues.* At the April meeting of the Executive Committee the appointment of an *ad hoc* committee was authorized to survey the problem of reconstituting such a committee (the previous committee having been dissolved) and to report the case, for and against, at the December meeting. At the December meeting, the matter was postponed to the April meeting.

*Committee on International Co-operation: the I.E.A.* (Gottfried Haberler, Chairman). The annual conference this year was held in September in Oxford, England, on the subject, "Business Fluctuations." Gottfried Haberler and R. A. Gordon attended as our representatives. Next year will be the third anniversary and a meeting of the Council will be held. This meeting will be held at Santa Margherita Ligure in Northern Italy in late August and the subject of the round table will be "Economic Progress."

The first number of a new series of translations, *International Economic Papers*, prepared under the auspices of the International Economic Association and published by Macmillan, was announced in the *American Economic Review*, June, 1952 (page 508). A second number has since appeared. These issues can be obtained at a price concession by members.

*Committee on Honors and Awards* (I. L. Sharfman, Chairman). The Committee submitted its recommendations for the Francis A. Walker award (made to J. M. Clark at the annual business meeting, December, 1952). The duties of this Committee are continuous and it has a rotating membership of six.

*Committee on Foreign Honorary Members.* This Committee is not yet

reconstituted. The matter was shifted from H. A. Innis to A. F. Burns and now to C. B. Hoover.

*Committee on Freedom of Teaching, Research, and Publication in Economics* (T. W. Schultz, Chairman). The Committee on Academic Freedom was discharged by action taken at the April, 1952, Executive Committee meeting and a new committee with the above title authorized to "draw up a statement formulating the functions of such a committee, to explore a 'pilot' case to test out operations, and to submit a report at the December meeting." Names were suggested for membership, but these were not acted upon by H. A. Innis and the committee constituted by A. F. Burns felt that they could not prepare a report for December. The American Textbook Publishers Institute has a committee which is concerned with attacks on economics textbooks and suggests co-operation with our Committee.

*Ad Hoc Committee on Graduate Training in Economics* (H. R. Bowen, Chairman). A preliminary draft of thirteen chapters has been prepared by H. R. Bowen during the past eighteen months and sent to members of the committee of advisers. H. R. Bowen made a report at the business meeting.

Other surveys referred to in last year's report (J. F. Wellemeyer and Taulman Miller, of the A.C.L.S. National Registration; Dael Wolfe, of the Commission on Human Resources and Advanced Training) are still in process. The A.C.L.S. project has completed its survey but economics cards have not been processed. Summaries of some groups have been reported.

*Commission on Economics in Teacher Education.* Secretary accepted membership and attended a meeting in New York in February. E. G. Nourse, P. J. Strayer, and Laurence Leamer were also present. Horace Taylor was unable to attend. Organization and program matters were discussed. The Secretary was not able to attend the second meeting at Riverdale in September but we have full reports from G. Derwood Baker and Horace Taylor. Director G. Derwood Baker, of the Council on Economic Education, requests that we consider formally their invitation to co-operate with the Commission through an officially appointed American Economic Association committee on economics in teacher education. I recommend the appointment of such a committee on the grounds that this activity is a legitimate and logical one in which we should participate. Many of our members are interested. If we disregard it, we will have no voice in the determination of policies and activities vitally affecting the profession—ones which educators themselves are not technically qualified to carry on alone. We have made some progress in major fields; e.g., teaching economics on the undergraduate level and graduate training in economics. There still remain the areas of economics in secondary schools and economics for the layman. The best approach to these areas may well be teaching teachers what to teach and how to teach economics. We should share responsibilities, not only in promoting research, but also promoting education in economics on every level.

*Reports of Council Representatives.* Reports of our representatives to the American Council of Learned Society and to the Social Science Research Council and to the National Bureau of Economic Research are published below.

*Committees Appointed During the Year*

## COMMITTEE ON ELECTIONS

Donald S. Warning, *Chairman*  
 Harold W. Torgerson  
 James Washington Bell, *Ex Officio*

## COMMITTEE ON RESEARCH AND PUBLICATIONS (effective January 1, 1953)

John P. Miller, *Chairman* (1955)  
 Theodore W. Schultz (1953)  
 George W. Stocking (1954)  
 Donald H. Wallace (1955)  
 Simeon E. Leland (1953)  
 Joseph J. Spengler (1954)  
 Jacob Marschak (1955)  
 James Washington Bell, *Ex Officio*

## COMMITTEE ON RESOLUTIONS

John C. Clendenin, *Chairman*  
 Captain William McKee  
 Richard Ruggles

COMMITTEE ON ECONOMICS IN  
TEACHER EDUCATION

Ben W. Lewis, *Chairman*  
 Archibald McIsaac  
 Horace Taylor

## COMMITTEE ON LOCAL ARRANGEMENTS

Robert T. Glidden, *Chairman*

## COMMITTEE ON FREEDOM OF TEACHING, RESEARCH, AND PUBLICATION IN ECONOMICS

(Authorized but not constituted)

## NOMINATING COMMITTEE

Frank H. Knight, *Chairman*  
 Frank A. Knox  
 Anne Bezanson  
 Donald H. Wallace  
 George H. Hildebrand  
 Clair Wilcox

*Ad Hoc* COMMITTEE ON GRADUATE TRAINING IN ECONOMICS

Howard R. Bowen, *Chairman*  
 George L. Bach  
 Milton Friedman  
 I. Leo Sharfman  
 Joseph J. Spengler

## FINANCE COMMITTEE

Roy C. Osgood, *Chairman*  
 C. Wells Farnham  
 James Washington Bell

*Standing Committees*

## COMMITTEE ON HONORS AND AWARDS

I. L. Sharfman, *Chairman* (1952)  
 Calvin B. Hoover (1952)  
 George L. Bach (1954)  
 Edward S. Shaw (1954)  
 Norman S. Buchanan (1956)  
 Fritz Machlup (1956)

## COMMITTEE ON INTERNATIONAL CO-OPERATION

Gottfried Haberler, *Chairman*  
 Howard S. Ellis  
 Theodore W. Schultz  
 James Washington Bell

## COMMITTEE ON PUBLICATIONS

Norman S. Buchanan, *Chairman*  
 Arthur F. Burns  
 Joseph J. Spengler  
 James Washington Bell

## COMMITTEE ON RESEARCH

Simeon E. Leland, *Chairman*  
 Harold A. Innis (deceased)  
 George W. Stocking  
 Theodore W. Schultz  
 Donald H. Wallace  
 Joseph J. Spengler  
 Richard B. Heflebower

## INTERNATIONAL ECONOMIC ASSOCIATION REPRESENTATIVES

Gottfried Haberler, *Chairman*  
 (1955)  
 Howard S. Ellis (1955)  
 John H. Williams (1952)  
 John V. Van Sickle (1952)

## COMMITTEE ON HONORARY MEMBERS

Wassily W. Leontief, *Chairman*  
 P. T. Ellsworth  
 Paul A. Samuelson

*Representatives of the Association on Various Occasions*

American Academy of Political and Social Science, 56th Annual Meeting

Anne Bezanson

Charles R. Whittlesey

Third Annual Conference on the Caribbean (University of Florida)

Clark Lee Allen

Centennial Convention of American Pharmaceutical Association

C. Rufus Rorem

United States Military Academy, West Point, Sesquicentennial Year Celebration

George A. Lincoln

Université Laval Centennial

Marcel Bélanger

Inauguration of University and College Presidents:

Lewis Webster Jones, Rutgers University

Broadus Mitchell

John T. Rettaliata, Illinois Institute of Technology

Yale Brozen

Russell Jay Humbert, De Pauw University

Hiram L. Jome

*Use of Mailing List*

The use of our mailing list to send the materials indicated was granted to the following:

American Council of Learned Societies: To send questionnaires for the National Registration Project.

Citizenship Clearing House: *Preparing College Men and Women for Politics*.

National Bureau of Economic Research: To announce their publications.

American Institute for Economic Research: To announce fellowship awards.

Alfred A. Knopf, Inc.: To send circulars on Heilperin's *The Trade of Nations*.

Swift & Company: Annual Report.

Life Insurance Association of America: Annual report on accident and health coverage in the United States.

Commercial Credit Corporation: *The Role of the Sales Finance Companies in the American Economy*, by Clyde W. Phelps.

Christian Freedom Foundation: *Christian Economics*.

Chamber of Commerce of the United States: To send copy of *Economic Intelligence* and to offer free subscription.

National Planning Association: To send notice of *The American Economy in 1960*, by Gerhard Colm.

It is with regret that the names of the following persons have been removed from our active membership list, notice of their deaths having been received during the year.

Adolph H. Armbruster	William T. Jackman
George B. L. Arner	Sterling E. Jones, Jr.
Frank Buchanan	Albert G. Keim
Fisher A. Buckingham	Mortier W. La Fever
John Ray Cable	Sam A. Lewisohn
Harry M. Cassidy	Donald M. Marvin
Ann Aikin Ellis (Mrs. David W.)	Arthur E. Murdoch
Feodore F. Foss	Roswell C. McCrea
Elisha M. Friedman	John H. Patterson
George G. Groat	Gabriel A. D. Preinreich
Ernest H. Hahne	Howard H. Preston
Samuel F. Houston (Life Member)	Carl J. Ratzlaff
Harold A. Innis	Lester Roth

George Thomas

Respectfully submitted,

JAMES WASHINGTON BELL, *Secretary*



EXHIBIT I  
PUBLICATION COSTS

Year*	PAPERS AND PROCEEDINGS			HANDBOOKS		
	Number of Pages	Number of Copies	Cost	Number of Pages	Number of Copies	Cost
1930	222	4,300	\$ 1,353.91			
1931	308	4,300	1,919.18	88	4,200	\$ 589.54
1932	316	4,200	1,819.75			
1933	216	4,000	1,284.85	88	3,900	522.71
1934	232	3,700	1,192.91			
1935	248	4,000	1,347.88			
1936	360	4,200	2,037.90	58	4,100	454.36
1937	344	4,300	1,922.03			
1938	200	4,500	1,234.10	112	4,500	1,118.84†
1939	288	4,600	1,785.91			
1940	414	4,900	2,658.12	108	5,000	822.58
1941	479	5,200	3,294.45			
1942	548	5,400	3,909.79	208	5,500	1,775.72‡
1943	535	5,500	3,652.56			
1944	470	5,800	3,350.40			
	144	5,900	1,215.22‡			
1945	536	6,400	4,502.84			
1946	960	6,700	8,149.90	113	6,900	2,035.71
1947	781	7,700	8,140.79			
1948	591	8,500	8,701.41	315	7,700	6,948.07‡
1949	537	9,500	7,844.50			
1950	650	10,100	9,864.76	41	9,200	1,163.84†
1951	816	10,400	11,965.40	18	8,300	692.63‡
1952	768	10,700	13,190.83	11	8,188	620.09‡

\* This is the year of publication and pertains to the meeting of the preceding year. The figures are published in the subsequent year.

† "Who's who" volumes; 1950—"Who's who" supplement; 1951 and 1952—names and addresses supplement.

‡ Part of papers presented at annual meeting published as supplement to June number.

EXHIBIT II  
MEMBERS AND SUBSCRIBERS

Class of Membership	Totals 11/30/51	Added	Removed	Gain or Loss	Totals 11/30/52
Annual .....	6,204	778*	438§	340	6,544
Junior .....	634	329‡	479*	150	484
Family .....	123	15	16	1	122
Complimentary .....	37	9	5	4	41‡
Life .....	48	8	2	6	54
Honorary .....	22	—	—	—	22
	7,068	1,139	940	199	7,267
Subscribers .....	2,662	525	462	63	2,725
Complimentary .....	30	—	—	—	40
Totals .....	9,760	1,664	1,402	262	10,022

\* Includes 243 junior members changed to annual.

† Includes 25 annual members changed to juniors.

‡ Includes 6 who do not receive publications.

§ Resigned, 92; nonpayment, 247; died, 22; lack of address, 52; changed to junior, 25.

# REPORT OF THE TREASURER OF THE ASSOCIATION FOR THE YEAR ENDING NOVEMBER 30, 1952

Details of operating results of the past year and the statement of our financial position are presented in the Auditor's Report. This analysis presents the facts in a slightly different manner and is designed to facilitate making policy decisions giving direction to our activities.

*Income and Expenses.* The following summary shows the major sources of our income and the chief items of expenditure this year compared with last year and five years ago. The grouping of items differs from that found in the Auditor's Report in that here all sources of income are grouped together, as are all the items of expenditure, whereas the Auditor's Report treats publication results separately.

## Comparative Results of Operations for 1952, 1951, and 1947

<i>Income</i>	11/30/52	11/30/51	12/6/47
Membership dues .....	\$41,340	\$39,812	\$25,366
Subscriptions .....	15,825	15,553	10,543
Sales .....	2,266	2,251	1,399
Advertising .....	7,066	7,424	3,654
Republications income .....	—	1,854	—
Sundry income .....	973	—	—
Dues and publications income .....	\$67,470	\$66,894	\$40,962
Interest .....	\$ 1,118	\$ 1,026	\$ 1,227
Dividends .....	3,681	4,608	2,910
Less custodian fees .....	179	157	—
Sales of securities (net) .....	3,569	2,788	1,056
Investments (less fees) .....	\$ 8,189	\$ 8,265	\$ 5,077
Total Income .....	\$75,659	\$75,159	\$46,039
<i>Expenses</i>			
Office salaries .....	\$14,537	\$12,735	\$ 8,239
Other administrative expenses .....	3,942	3,604	3,178
Annual meeting (net) .....	644	501	1,400
Executive Committee .....	1,952	1,016	1,094
Other committee expenses .....	758	583	129
Review moving expense .....	477	—	—
Administrative and operating .....	\$21,022	\$18,439	\$14,040
Review printing .....	\$24,561	\$20,255	\$15,798
Papers and Proceedings printing .....	13,191	11,965	8,141
Directory printing .....	620	693	—
Editorial office (Review):			
Contributors .....	2,290	1,654	1,761
Editorial and clerical salaries .....	9,493	7,785	6,391
Other expenses (net) .....	652	553	698
Publications .....	\$50,816	\$42,905	\$32,789
Total Expenses .....	\$71,838	\$61,344	\$46,829
Net operating income .....	\$ 3,821	\$13,815	\$ 700
Appropriations .....	—	1,100	—
Net Income or deficit .....	\$ 3,821	\$12,715	\$ 700

Total income from all sources (grants from outside sources for specific purposes are excluded) amounted in the fiscal year 1952 to \$75,659, exactly \$500 more than in 1951. The difference is accounted for by small increases in dues and subscriptions, sundry income, annual meeting, interest on bonds, and profit on securities sales, offset in part by a decline in advertising income, lower dividend receipts (see Report of Finance Committee), and no proceeds taken in the form of republication income (see Report of Committee on Publication).

Total expenses of \$71,838 represent an increase of about \$10,500 over last year. All items contributed to this increase—publication expenses having increased most (about 16 per cent), although administrative and operating expenses were over 12 per cent above last year. Our business has grown but our costs keep up with the tempo of our expansion. We have had to hire more help, pay higher wages, raise salaries and contributors' honoraria, and meetings cost more and so do supplies and printing. (See Auditor's Report for breakdown of publication expense.)

Total operating income of \$75,659 less \$71,838, expenses, gives us a net operating income of \$3,821. This is nearly \$10,000 less than last year (not counting \$1,100 appropriated in 1951) but it is, nonetheless, very satisfactory. Last year's large net income was abnormal in several respects, as was explained in the Treasurer's Report of that year. Compared with 1947, when the budget (before \$3,700 appropriations) was just short of being in balance (\$790 deficit), net incomes for the past four years have been very favorable. Moreover, in 1948, we ran a deficit of \$6,400, which proves that we do experience red figures; e.g., 1941, 1932, 1920, and 1911 were deficit years.

*Financial Condition.* The accompanying balance sheet figures show the comparative status of the principal assets, liabilities, appropriated and other funds, and surplus account for the current year, last year, and five years ago.

*Comparative Financial Conditions for 1952, 1951, and 1947*

<i>Assets</i>	11/30/52	11/30/51	12/6/47
Cash on deposit and on hand .....	\$ 7,498	\$ 15,058	\$ 10,436
Receivables (net) .....	2,995	2,668	1,953
Prepaid expenses and inventories .....	937	658	564
Furniture and fixtures (net) .....	1,742	1,421	488
Investments at cost:			
Bonds .....	42,313	43,340	37,964
Stocks .....	58,934	49,764	48,756
Total assets .....	\$114,410	\$112,909	\$100,161
<i>Liabilities and Funds</i>			
Accounts payable .....	\$ 7,797	\$ 6,031	\$ 8,914
Accrued salaries .....	—	—	305
Allied Social Science Associations .....	—	—	829
Deferred income .....	7,044	7,383	14,819
Membership extension fund .....	707	855	1,308
Fund for proposed secretariat .....	—	—	35
Fund for Committee on Graduate Training in			
Economics .....	2,656	2,204	—
Fund for Committee on Publications .....	3,215	7,172	—
Committee appropriations (not expended) .....	1,357	2,243	5,803
Life memberships .....	6,225	5,650	3,625
Total liabilities and funds .....	\$ 29,001	\$ 31,538	\$ 35,638

## REPORT OF THE TREASURER

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<i>Surplus</i>	11/30/52	11/30/51	12/6/47
Balance at beginning of period .....	\$ 81,372	\$ 68,606	\$ 68,888
Transfers from life memberships .....	225	50	125
Net income or loss for period .....	3,821	12,715	4,490
Unappropriated surplus .....	\$ 85,417	\$ 81,371	\$ 64,523
Total footings .....	\$114,419	\$112,909	\$100,161

Asset items consist of cash, receivables (chiefly unpaid dues and sales and the December *Review* advertising), prepaid expenses (supplies on hand and insurance in force), furniture and fixtures (depreciated), and investments at cost (see exhibit of the investment record at the end of this report). Total assets of \$114,419 show an increase of \$1,510 over those of last year. The cash item for 1951 was abnormally larger due to the Rockefeller and Carnegie grants. Investments in stocks reflect new commitments and some capital appreciation.

Liability items consist of accounts payable to printers, such as the December number of the *Review*, deferred income (prepaid membership dues and subscriptions), life memberships (which have increased slightly since we lowered the rate from \$200 to \$100 in 1950), and unexpended Association and other funds appropriated for specific activities.

Funds and committee appropriations call for some explanation.

The fund for Committee on Graduate Training in Economics represents the grant of \$16,000 made by the Rockefeller Foundation in 1951. This amount has been fully paid in three installments. A summary of the budget and disbursements is shown below.

The Carnegie Corporation generously agreed in 1951 to underwrite to the amount of \$8,000 the preparation and publication of *A Survey of Contemporary Economics*, Volume II. This amount, together with \$2,000 transferred from the Research Committee appropriation, comprises the fund authorized to finance this Publication Committee project. The sum of \$14,700 has been budgeted to cover the costs; namely, \$6,700 for editorial and \$8,000 for production. It is expected that the production costs will be fully defrayed from the sale of the volume.

No new appropriations were made this past year for committee activities. A history of these appropriations as well as of outside funds was presented in last year's report and only their present status need be shown here.

*Summary Status of Appropriations and Funds*

	Previous Balance	Disbursements		Unexpended Balance
		1951	1952	
1. Graduate Training in Economics .....	\$16,000	3,129	10,214	2,656
2. Committee on Publication .....	10,000	6,615	—	3,385
3. Committee on Research .....	547	—	—	547
4. Committee on Public Issues .....	795	—	—	795
5. Undergraduate Teaching of Economics .....	900	(transferred to income)		—
6. Membership Extension .....	855	148	—	707

Our net worth, or surplus balance, after deducting liabilities and funds from total assets amounts to \$81,371. Adding \$3,821 net income for the year and \$225 for lapsed life memberships, we have an unappropriated surplus of

\$85,417—a new high for our financial backlog to make us comfortable in planning our future activities.

The history of net annual income or deficit and the growth of accumulated surplus from 1909 to 1944 is reviewed in the Treasurer's Report presented in the *Proceedings* of May, 1945, pages 472-477, and subsequent data may be found in succeeding annual reports. A previous high surplus figure of \$69,000 was reached in 1946. It then declined to \$58,200 in 1948. Since then it has increased in succeeding years, in thousands, to \$63.3, \$68.6, \$81.3, to its present figure of \$85.4. But we should not be too complacent. We are dealing with present-day dollars and with appropriate allowance for its shrunken purchasing power we have no greater financial protection against future exigencies than we had in 1939 or 1932. We have just kept abreast with changing conditions. For the time being, however, we may with some assurance continue our operations on the present scale, with dues and subscriptions remaining at \$6.00 per annum. For that assurance our present and prospective members should be duly thankful.

Respectfully submitted,

JAMES WASHINGTON BELL, *Treasurer*

#### INVESTMENT PORTFOLIO

Year	At Par	Cost			Market
	Bonds	Bonds	Stocks	Total	Stocks and Bonds
1925	\$25,000	\$24,661.75		\$24,661.75	
1930	31,000	32,439.48		32,439.48	
1933	33,500	32,962.48	\$ 3,954.23	36,916.71	\$31,522.50
1935	16,000	15,280.48	28,114.50	43,394.98	50,338.72
1940	25,000	22,519.80	41,155.95	63,675.75	60,553.88
1942	27,000	24,651.12	41,556.06	66,207.18	58,211.88
1945	40,000	36,705.95	44,955.81	81,661.76	103,574.76
1948	35,000	33,108.63	48,624.14	81,732.77	84,841.91
1950	35,000	33,108.63	51,978.53	85,087.16	104,177.27
1951	43,000	43,340.16	49,764.51	93,104.67	117,316.75
1952	42,000	42,312.67	58,934.00	101,246.67	130,836.02

#### RETURN ON INVESTMENTS

Year	Bonds	Stocks	Total	Rate of Return on Cost
1925	\$1,350.00		\$1,350.00*	
1930	1,695.21		1,695.21	5.22%
1933	1,679.49	\$ 108.57	1,788.06	4.84
1935	1,022.96	680.70	1,703.66	3.92
1940	1,037.56	2,182.46	3,220.02	5.06
1942	1,306.49	2,186.17	3,492.66	5.28
1945	1,479.99	2,488.85	3,968.84	4.71
1948	1,194.85	2,944.31	4,139.16	5.06
1950	1,117.50	3,860.39	4,977.89	5.85
1951	1,026.30	4,607.67	5,633.97	6.05
1952	1,117.84	3,681.53	4,799.37	4.75

\* Estimated income for year.



# REPORT OF THE FINANCE COMMITTEE

December 24, 1952

*Executive Committee,  
American Economic Association,  
Evanston, Illinois.*

GENTLEMEN:

We submit herewith a report of the investment holdings of the Association as of the close of business, November 30, 1952, together with an account of the changes which have been made during the year. A long-run view of our total holdings of stocks and bonds at cost and at market, with rate of return on cost, accompanies the Treasurer's Report immediately preceding. An analysis of the investment account of the American Economic Association, by W. H. Steiner in 1947 (*Proceedings*, pages 729-739), presents a critical examination of our investment policy from 1925 to 1945.

Bond holdings today are slightly less than of a year ago, both at cost (\$42,356 compared to \$43,340) and at market value (\$41,567 for 1952 and \$42,206 for 1951); whereas we hold more stock, at a cost of \$59,023 compared with \$49,764 in 1951, with higher market values of \$89,269 compared with \$75,110, or a total increase of \$8,274 in costs and \$13,520 in market value.

During the past fiscal year, the following changes were made.

## *Sales and Purchases of Bonds and Stocks (11/30/51 to 11/30/52)* (in round figures)

Sold	Cost	Selling Price	Profit or Loss
100 Glidden Co. ....	\$ 1,684	\$ 3,387	\$1,703
100 National Dairy Products Corp. ....	3,863	5,334	1,471
4 Standard Oil Co. of N.J. ....	221	300	78
25 International Harvester Co. ....	3,687	4,052	365
\$ 900 Houston Lighting and Power Co. ....	965	1,110	154
1,000 Reading Co. ....	1,010	845	165
8,000 U. S. Treasury Bonds, 2½% ....	8,000	7,968	32
20,000 U. S. Treasury, 1½% ....	20,028	20,000	28
80 rights, Standard Oil of Indiana ....	24	46	22
	<hr/> \$39,482	<hr/> \$43,051	<hr/> \$3,569
Bought	Cost		
50 Aluminum Co. of America ....	\$ 4,266		
50 Peoples Gas, Light & Coke Co. of Chicago	6,466		
100 Pillsbury Mills ....	3,654		
100 Sylvania Electric Products ....	4,017		
10 Socony-Vacuum Oil Co. ....	310		
\$15,000 U.S.A. Treasury Notes, 2½% ....	15,000		
5,000 U.S. Treasury Certif. of Indebt. ....	5,011		
8,000 U.S. Treasury 2¾% ....	8,000		
900 Houston Lighting and Power Co. ....	900		
	<hr/> \$47,624		

Accompanying this report is the "List of Securities Held by the Association," with cost and market as of November 28, 1952. Adjustments in cost figures have been made to take account of value of rights issued and sold; e.g., Houston Lighting and Power Company and Standard Oil of Indiana. The market valuation of \$8,000 U. S. Treasury, 2¾% "B's," is stated at their value if converted into Treasury 1½'s at current date rather than at par (which would be equally good practice). The conversion of \$20,000 U. S. Treasury 1¾'s into \$15,000, 2½%, and \$5,000, 1¾ certificates was done at a slight loss but the change increases our income modestly.

The Committee has had several formal meetings during the year and its members have been in close personal contact. Analyses of our holdings have been made at intervals by staff members of our associates on basis of yield, industry, growth, income, etc., and all suggestions and recommendations have been given careful consideration.

Respectfully submitted,

ROY C. OSGOOD, *Chairman*  
C. WELLS FARNHAM  
JAMES WASHINGTON BELL

#### LIST OF SECURITIES HELD BY THE ASSOCIATION

STOCKS			
Number of Shares of Common Stock	Issue	Cost	Market or Last Sale 11/28/52
50	Aluminum Co. of America .....	\$ 4,266.15	\$ 4,262.50
200	Central Southwest Corp. ....	2,808.88	4,075.00
100	Continental Can Co. ....	3,714.55	4,800.00
100	General Electric Co. ....	2,738.19	7,025.00
100	B. F. Goodrich Co. ....	5,456.43	7,450.00
124	Gulf Oil Corp. ....	3,714.97	6,138.00
25	Household Finance Corp. ....	829.12	1,193.75
300	Houston Lighting and Power Co. ....	3,088.53	7,575.00
100	Kroger Co. ....	1,851.74	4,000.00
50	Monsanto Chemical Co. ....	3,120.74	4,581.25
25	J. C. Penney Co. ....	370.13	1,737.50
50	Peoples Gas Light and Coke Co. ....	6,466.15	6,487.50
60	Chas. Pfizer and Co. ....	2,316.05	2,010.00
100	Pillsbury Mills ....	3,653.78	3,712.50
75	Procter and Gamble Co. ....	2,459.72	5,146.87
110	Socony-Vacuum Oil Co. ....	3,322.44	3,877.50
30	Standard Oil Co. of Indiana ....	3,305.05	5,940.00
100	Sylvania Electric Products ....	4,017.44	4,100.00
75	Union Carbide and Carbon Corp. ....	1,433.94	5,156.25
		\$ 58,934.00	\$ 89,268.62
BONDS			
Par Amount	Issue	Cost	Market or Last Sale 11/28/52
\$4,000	Illinois Central Ry. 4¾% due 1995 .....	\$ 4,026.17	\$ 4,145.00
5,000	U. S. Treasury Certif. of Indebt. 1¾% due 2/15/53 .....	5,010.87	4,998.40
3,000	U. S. Defense Bonds Series "G" 2½% due 1954 .....	3,000.00	2,919.00
8,000	U. S. Treasury 2¾% .....	8,000.00	7,750.00
7,000	U. S. Treasury Bonds 2½% due 12-15 72/67 .....	7,275.63	6,755.00
15,000	U. S. Treasury Notes "A-1953" 2½% .....	15,000.00	15,000.00
		\$ 42,312.67	\$ 41,567.40
	Stocks .....	58,934.00	89,268.62
	Total .....	\$101,246.67	\$130,836.02

## REPORT OF THE AUDITOR

December 18, 1952

*Executive Committee  
American Economic Association  
Evanston, Illinois*

DEAR SIRS:

In accordance with instructions we have examined the accounts and related records of the American Economic Association for the year ended November 30, 1952, and now submit our report thereon together with the following exhibits:

Statement of Financial Position—November 30, 1952	Exhibit 1
Statement of Income and Expenses for Year Ended November 30, 1952	Exhibit 2

### *Results from Operations*

Net income for the year ended November 30, 1952, was \$3,821 compared with net income of \$12,715 for the year ended November 30, 1951, as shown in the following summary:

Particulars	Year Ended Nov. 30 1951	1952	Increase Decrease
<b>Income:</b>			
Dues .....	\$39,812	\$41,340	\$ 1,528
Interest and dividends (net) .....	5,477	4,620	857
Profit on sales of securities (net) .....	2,788	3,569	781
Republication income .....	1,854	—	1,854
Miscellaneous income .....	—	973	973
Total income .....	\$49,931	\$50,502	\$ 571
<b>Expenses:</b>			
Publication expenses .....	\$42,906	\$50,817	\$ 7,911
Less—Publication income .....	25,229	25,158	71
Net publication expense .....	\$17,677	\$25,659	\$ 7,982
Administrative and other operating expenses ..	18,439	21,022	2,583
Total expenses .....	\$36,116	\$46,681	\$10,565
Net operating income .....	\$13,815	\$ 3,821	\$ 9,994
Appropriations for special committees .....	1,100	—	1,100
Net income .....	\$12,715	\$ 3,821	\$ 8,894

The increase in dues reflects the increase in membership during the year under review, as reported by the secretary:

Classification	Number of Members at November 30	
	1951	1952
Regular .....	6,204	6,544
Junior .....	634	484
Family .....	123	122
Life .....	48	54
Honorary .....	22	22
Complimentary .....	37	41
Total .....	<u>7,068</u>	<u>7,267</u>

Interest on bonds owned was accounted for in accordance with stated rates; dividends received on stocks were compared with amounts reported in published records of dividends paid.

Net publication expense, as shown in the following summary, amounted to \$25,659 for the current year compared with \$17,677 for the preceding year:

Particulars	Year Ended November 30		Budgetary Estimates for Year 1952
	1951	1952	
Expenses:			
Printing of—			
<i>Review</i> .....	\$20,255	\$24,561	\$23,000
<i>Directory and Handbook</i> .....	693	620	—
<i>Proceedings</i> .....	11,965	13,191	—
Editor's honorarium .....	2,500	3,417	2,500
Payments to contributors .....	1,654	2,299	1,650
Editorial clerical salaries .....	5,285	6,076	5,300
Editorial supplies and expenses .....	564	730	550
Sundry publication expenses .....	10	77	—
Total expenses .....	<u>\$42,906</u>	<u>\$50,817</u>	
Less—Income:			
Subscriptions, other than members .....	\$15,554	\$15,825	
Sales of copies .....	2,251	2,268	
Advertising .....	7,424	7,065	
Total income .....	<u>\$25,229</u>	<u>\$25,158</u>	
Net publication expenses .....	<u>\$17,677</u>	<u>\$25,659</u>	

There was an increase of \$7,982 in net publication expense (from \$17,677 to \$25,659) consisting of the following:

Expenses:	
Printing costs .....	\$5,459
Salaries and honorarium .....	1,708
Payments to contributors .....	645
All other (net) .....	170
Total increase (net) .....	<u>\$7,982</u>

The December, 1952, issue of the *Review* had not been printed at the time of our examination. The publishers estimated the *Review* printing to cost \$6,816 which amount is included in the above tabulation.

There were no appropriations during the year to the Committee Funds listed below. We were advised that the work of the Committee on Undergraduate Teaching and Training of Economists has been completed. In accordance with a resolution by the Executive Committee, the unexpended portion was transferred to income for the current year.

Funds	Unexpended Balance Nov. 30, 1951	Received During Year	Transferred to Income During Year	Unexpended Balance Nov. 30, 1952
Committee on Research .....	\$ 547.17	\$ —	\$ —	\$ 547.17
Committee on Undergraduate Teaching of Economics and Training of Economists .....	900.83	—	900.83	—
Committee on Public Issues .....	794.91	—	—	794.91
Sundry .....	—	14.75	—	14.75
Total .....	<u>\$2,242.91</u>	<u>\$14.75</u>	<u>\$900.83</u>	<u>\$1,356.83</u>

### Financial Position

Condensed statements of financial position of the Association at November 30, 1951, and 1952 are compared below:

Assets	November 30		Increase Decrease
	1951	1952	
Cash on deposit and on hand .....	\$ 15,058	\$ 7,498	\$ 7,560
Receivables (net) .....	2,668	2,995	327
Prepaid expenses .....	658	936	278
Furniture and fixtures (net) .....	1,421	1,742	321
Investments at cost—			
Bonds .....	43,340	42,313	1,027
Stocks .....	49,764	58,934	9,170
	<u>\$112,909</u>	<u>\$114,418</u>	<u>\$ 1,509</u>
Liabilities, Funds and Surplus			
Accounts payable .....	\$ 6,031	\$ 7,797	\$ 1,766
Deferred income .....	7,383	7,044	339
Membership extension fund .....	855	707	148
Fund for committee on graduate training in economics .....	2,204	2,656	452
Fund for committee on publication .....	7,172	3,215	3,957
Committee funds appropriated (not expended) ..	2,243	1,357	886
Life memberships .....	5,650	6,225	575
Surplus—			
Balance at beginning of year .....	68,606	81,371	12,765
Net income for year .....	12,715	3,821	8,894
Transfers from life memberships .....	50	225	175
	<u>\$112,909</u>	<u>\$114,418</u>	<u>\$ 1,509</u>

Cash on deposit was satisfactorily reconciled with balances confirmed directly to us by the depositories.

The receivables of the Association were not confirmed by correspondence with debtors. Based upon the Association's past experience the reserve for doubtful accounts appears to be adequate to cover normal losses.

Changes in the investment account were verified by the examination of brokers' invoices and other supporting data. Securities held at November 30,



1952, were confirmed directly to us by the State Bank and Trust Company of Evanston, Illinois, custodian for the Association, or were traced to statement indicating they were in hands of stockbroker.

Insofar as we were able to ascertain, all liabilities of the Association at November 30, 1952, are reflected in the accompanying statement of financial position and the Secretary has represented to us that to the best of his knowledge all liabilities are disclosed.

A summary of the transactions in the various funds is presented hereunder:

Particulars	Membership Extension Fund	Committee on	
		Graduate Training in Economics	Publication
Balance November 30, 1951 .....	\$855.16	\$ 2,204.12	\$7,171.50
Grant by Rockefeller Foundation .....		10,666.67	
Total .....	\$855.16	\$12,870.79	\$7,171.50
Funds expended to November 30, 1952 .....	148.60	10,214.33	3,956.43
Balance November 30, 1952 .....	\$706.56	\$ 2,656.46	\$3,215.07

Data relating to Committee Funds appropriated (not expended) are presented above.

We wish to take this opportunity to express our appreciation of the courtesies and co-operation extended to our representatives during the course of the examination.

Very truly yours,

DAVID HIMMELBAU & Co.

*Certified Public Accountants*

AMERICAN ECONOMIC ASSOCIATION  
STATEMENT OF FINANCIAL POSITION—NOVEMBER 30, 1952

Assets		Liabilities, Funds and Surplus	
<b>CURRENT ASSETS:</b>		<b>CURRENT LIABILITIES:</b>	
Cash on deposit and on hand—		Accounts payable .....	\$ 7,760.00
State Bank and Trust Company, Evanston .....	\$ 3,509.41		
National Bank of Commerce of Chicago ..	3,963.90	<b>DEFERRED INCOME:</b>	
Petty cash .....	25.00	Prepaid subscriptions .....	5,762.46
		Prepaid dues .....	1,281.71
<b>Receivables—</b>			
Review advertising .....	\$ 1,644.63	<b>MEMBERSHIP EXTENSION FUND .....</b>	<b>706.56</b>
Interest accrued on bonds .....	312.82		
Publication sales .....	225.31	<b>FUND FOR COMMITTEE ON GRADUATE TRAINING IN ECONOMICS .....</b>	<b>2,656.46</b>
Membership dues .....	627.38		
Sundry .....	519.76	<b>FUND FOR COMMITTEE ON PUBLICATION .....</b>	<b>3,215.07</b>
Total receivables .....	\$ 3,329.90	<b>COMMITTEE FUNDS APPROPRIATED (not expended) .....</b>	<b>1,356.83</b>
Less—Reserve for doubtful accounts .....	335.07		
Inventory of stamps and envelopes .....		<b>LIFE MEMBERSHIPS AND SURPLUS:</b>	
Unexpired insurance .....		Life memberships .....	\$ 6,225.00
		Unappropriated surplus—	
Total current assets .....	\$11,429.73	Balance November 30, 1951 .....	\$81,371.44
		Life membership transfer .....	225.00
<b>INVESTMENTS (at cost):</b>			
Bonds .....	\$42,312.67	Total .....	\$81,596.44
Stocks .....	58,934.00	Net income for year ended November 30, 1952 (Exhibit 2) ..	85,417.62
<b>FURNITURE AND FIXTURES (less accumulated depreciation)</b>	<b>1,742.21</b>		
Total assets .....	<b>\$114,418.61</b>	<b>Total liabilities, funds and surplus .....</b>	<b>\$114,418.61</b>

AUDITORS' OPINION

*Executive Committee  
American Economic Association:*

In our opinion the accompanying financial statement presents fairly the financial condition of American Economic Association at November 30, 1952, and the results of its operations for the year ended that date, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and other auditing procedures as we considered necessary in the circumstances.

Chicago, Illinois  
December 18, 1952

DAVID HUMMELBLAU & Co.  
Certified Public Accountants

## EXHIBIT 2

AMERICAN ECONOMIC ASSOCIATION  
STATEMENT OF INCOME AND EXPENSES  
FOR YEAR ENDED NOVEMBER 30, 1952

	Particulars	Amount
INCOME:		
Dues—		
	Regular, junior and family members .....	\$40,374.70
	Subscribing and contributing members .....	965.00
		<u>\$41,339.70</u>
Investments—		
	Interest on bonds .....	\$ 1,117.84
	Dividends .....	3,681.53
		<u>\$ 4,799.37</u>
	Less—Custodian fees .....	179.56
		<u>\$ 4,619.81</u>
	Gain on sale of securities (net) .....	3,568.50
		<u>8,188.31</u>
	Miscellaneous income (net) .....	973.61
		<u>\$50,501.62</u>
EXPENSES:		
Administrative and other operating expenses—		
	Secretary's salary .....	\$ 3,416.66
	Secretary's traveling expense .....	181.82
	Office salaries .....	11,120.63
	Annual meeting (net) .....	644.38
	Executive Committee expenses .....	1,951.85
	Other committee expenses .....	758.43
	Postage expense .....	1,005.78
	Stationery and supplies .....	1,000.96
	Insurance .....	169.12
	Provision for depreciation .....	159.23
	Telephone and telegraph .....	173.36
Dues and expenses—		
	American Council of Learned Societies .....	199.51
	International Economic Association .....	400.00
	Exchange on checks .....	12.53
	Social security taxes .....	263.67
	Moving expense .....	477.46
	Miscellaneous expense (net) .....	375.28
		<u>\$21,021.91</u>
Publication expenses—		
Printing of:		
	<i>Review</i> .....	\$24,560.62
	<i>Directory and Handbook</i> .....	620.09
	<i>Proceedings</i> .....	13,190.83
	Editor's honorarium .....	3,416.66
	Payments to contributors .....	2,299.00
	Editorial clerical salaries .....	6,076.10
	Editorial supplies and expenses .....	730.33
	Sundry publishing expenses .....	77.16
		<u>\$50,816.47</u>
Less—Publication income:		
	Subscriptions, other than members .....	\$15,824.73
	Sales of copies .....	2,267.65
	Advertising .....	7,065.56
		<u>25,157.94</u>
		<u>25,658.53</u>
	Total expenses .....	46,680.44
NET INCOME FOR YEAR ENDED NOVEMBER 30, 1952 (Exhibit 1) .....		<u>\$ 3,821.18</u>

# REPORT OF THE MANAGING EDITOR FOR THE YEAR ENDING DECEMBER, 1952

The responsibilities of the managing editor of the *Review* for the past year were shared by Paul T. Homan and myself—since, fortunately for me, my predecessor was willing to continue these duties until April 1. At that time, indeed, the transition was greatly facilitated by the fact that the June number of the *Review* was substantially ready for the printer.

I am sure that I do not need to tell members of the Association that I have taken over a smoothly running operation from exceedingly efficient hands. My predecessor has raised the *Review* to a high level of professional competence; he attracted to its editorial board a succession of distinguished and devoted members of the profession; he firmly established the *Review's* reputation for impartiality, objectivity, and receptiveness to ideas; and he and his associates have been responsible for a steady improvement in the quality of its contents. I hope that I can do as well.

The task of physically moving the editorial office from Los Angeles to Stanford was carried out without incident and without interruption of the routine—thanks very largely to the efficient supervision of Doris Merriam, assistant to the managing editor.

An analysis of the contents of Volume XLII shows a rather considerable concentration in the fields of economic theory and international economics, a secondary emphasis upon business fluctuations and public finance, and one or two articles in each of eight other areas. This distribution of articles with respect to fields, however, does not reflect any editorial policy or bias; if anything, it reflects simply the distribution of interests of those who submitted the better-quality articles. Very few really good articles were turned away.

The number of manuscripts received has been slightly below the level of recent years. Comparative figures follow:

	1948	1949	1950	1951	1952
Manuscripts Received .....	205	200	197	222	190
Articles .....	110	144	156	157	133
Communications .....	95	56	41	65	57
Percentage of Articles Accepted .....	24%	20%	19%	10%	21%

A statistical summary of the contents of the *Review* in 1952 with corresponding figures for 1951 is presented below, omitting the advertising pages.

	1952		1951	
	No.	Pages	No.	Pages
Leading articles .....	28	428	29	468
Proceedings .....				26
Communications .....	19	77	20	78
Book reviews .....	173	349	148	293
Memorials .....				
Classified list of new books .....		59		62
Classified list of periodical articles .....		44		37
Classified list of dissertations .....		46		43
Notes .....		34		36
		1,037		1,043

The following table presents the actual expenditures in 1952 in comparison with the estimated budget and with actual expenditures in 1951:

	Budget 1952	Actual 1952	Actual 1951
Printing and mailing .....	\$23,000.00	\$24,511.76*	\$20,972.83†
Editorial .....	2,500.00	3,500.00	2,500.00
Editorial assistance .....	5,300.00	6,006.86	5,305.66
Supplies .....	550.00	613.55	563.28
Contributors .....	1,650.00	2,299.00	1,654.00
	<u>\$33,000.00</u>	<u>\$36,931.17</u>	<u>\$30,995.77</u>

\* Cost of December number estimated.

† Corrected from 1951 Annual Report

Expenditures in 1952 amounted to \$36,931 or \$3,931 in excess of the authorized budget. Printing costs exceeded the estimate by \$1,512. Extra cost is accounted for by the increase in the number of copies printed in excess of the budgeted level of 10,400, and by the inclusion of 200 pages in excess of the budgeted level of 1,000 pages. The number of copies, size, and cost of printing are shown by quarters in the following table:

	Copies Printed	Pages Net	Pages Gross	Cost Including Reprints
March .....	10,600	244	288	\$ 5,843.00
June .....	10,700	269	304	5,956.81
September .....	10,800	263	296	6,226.95
December .....	10,800	261	312	6,485.00 (estimated)
		<u>1,037</u>	<u>1,200</u>	<u>\$24,511.76</u>

The items for editorial expense and editorial assistance are in excess of the authorized amounts by \$1,707. Of this amount, \$1,450 reflects salary increases granted at the December meeting of the Executive Committee; the remainder is due to a somewhat higher hourly cost for typing than in 1951. The item, payments to contributors, is in excess of the budgeted amount by \$649, reflecting the new scale of honoraria approved by the Executive Committee at its April meeting.

The estimated costs for the coming year are presented below based on a volume of 1,000 pages and printing of 10,800 copies.

Recommended Budget for 1953	
Printing (paper, postage, reprints, etc.) .....	\$24,700
Editor's salary .....	3,500
Editorial assistance .....	6,350
Supplies .....	600
Contributors .....	2,500
	<u>\$37,650</u>

Respectfully submitted,  
BERNARD F. HALEY, *Managing Editor*



## REPORT OF THE COMMITTEE ON PUBLICATIONS

The sales of the volumes of reprinted articles published by The Blakiston Company and their successor, Richard D. Irwin, Inc., appear to have justified the high hopes of the officers of the Association when they launched this venture. The sales of the individual volumes to the end of the year 1952 are as follows:

Vol. I	<i>Readings in the Social Control of Industry</i> .....	5,591 copies
Vol. II	<i>Readings in Business Cycle Theory</i> .....	9,510 copies
Vol. III	<i>Readings in the Theory of Income Distribution</i> .....	7,778 copies
Vol. IV	<i>Readings in the Theory of International Trade</i> .....	5,826 copies
Vol. V	<i>Readings in Monetary Theory</i> .....	1,711 copies
Vol. VI	<i>Readings in Price Theory</i> .....	1,224 copies

One further volume is in the process of preparation, a volume on public finance and fiscal policy, by Professors J. Keith Butters and Arthur Smithies.

No further volumes are presently contemplated. It would appear that the Association has probably fulfilled its purpose in initiating this undertaking and that at least for the time being there is no crying need to sponsor further volumes in other branches of economics.

The volume of readings in Economic History, *Enterprise and Secular Change*, edited by Frederic C. Lane and Jelle C. Riemersma, which was sponsored jointly by the Association and the Economic History Association, was published late in 1952. Preliminary indications are that this volume too will have a favorable reception.

Two suggestions have come to the Committee proposing that the Association undertake the preparation of bibliographies in economics. In view of the fact that either undertaking would involve a considerable cost outlay, these proposals have been referred to the Executive Committee. The Committee on Publications is at least doubtful if there is sufficient need for such bibliographies as those proposed to justify the sizable effort and cost they would require.

Respectfully submitted,

NORMAN S. BUCHANAN

## REPORT OF OUR REPRESENTATIVES ON THE SOCIAL SCIENCE RESEARCH COUNCIL

Perhaps the most important bit of Council history since last year's report was a capital grant of \$1,500,000 from the Rockefeller Foundation. The Rockefeller Foundation, together with the Laura Spelman Rockefeller Memorial, has been the Council's most munificent provider since the Council's birth. The capital grant does not insure more ample funds for Council activities but places them on a more stable basis. It is designed to replace the two- or three-year grants periodically made by the Foundation to cover the cost of Council activities. Under the terms of the capital grant, during the next ten years only its annual income will be expendable. Thereafter the capital sum itself is expendable. Income from the capital grant plus annual contributions from other sources already arranged will provide the Council during the next eight years with about the same support it has previously had for administration and for its conference and planning activities.

Council activities during the past year of particular interest to economists include the work of the following committees, conferences, or seminars: Seminar on Source Material for the Mathematical Training of Social Scientists, Conference on Soviet Economic Growth, Committee on Economic Growth, Committee on Labor Market Research, and Committee on Census Monographs.

Although the Seminar on Mathematical Training for Social Scientists, which met at Dartmouth from June 23 to August 23, was concerned primarily with the training of social anthropologists, social psychologists, and sociologists, two economists sat in its councils. Its objective was to prepare a problem and source book "usable both by the mathematician who wishes to prepare courses to be taken by social scientists, and by the social scientist who wishes to see the mathematics he should learn, and to have some help in learning it." I am confident the source book that eventually emerges will not provide enough mathematical learning to turn a mediocre economist into a great one, although it might provide little enough to turn a great economist into a mediocre one. A more reasonable hope is that it may be useful in indicating the minimum mathematical training essential to the nonmathematical economist who seeks merely to understand what the mathematical economists have to say.

The Council's Committee on Slavic Studies sponsored the Conference on Soviet Economic Growth which met at Arden House, Harriman, New York, May 23-25. Twenty-eight economists and two geographers, representing a dozen American universities and a half-dozen governmental or quasi-governmental agencies, took part in it. The topics discussed included Russia's national income and product, capital formation and allocation, population and labor force, transportation, industrial resources and production, labor productivity, agricultural resources and output, economic relations with the orbit, and East-West trade. Many economists will join the Conference in its hope that the proceedings will be published in full.

The Committee on Economic Growth's ultimate objective, like that of most of the Council's committees, has been the improvement and expansion of research in the field with which it is concerned. Specifically, the Committee has been exploring the possibilities of improving research on the problem of why do some nations or regions experience more rapid economic growth than others—a problem of growing urgency in a world split by conflicting ideologies and sharp contrasts in living standards. The Committee held a conference of some fifty social scientists in New York City in April, 1952, on economic growth in Brazil, India, and Japan to determine whether or not comparative studies of economic growth in these selected areas might throw light on basic factors making for growth. The chairman in summarizing conference achievements noted three obstacles to a comparative approach: the difficulty of maintaining a broad frame of reference while using any particular measure of growth; the fact that the conditions of growth cannot be described in quantitative terms; and the difficulty of identifying the ultimate determinants of growth. The Committee plans that the conference papers, when revised and unified under the direction of a conference subcommittee, will be published in 1953. A Rockefeller Foundation grant to the Council which will permit Simon Kuznets, the Committee's chairman, to devote full time for several years to study of the course and causes of the economic growth of nations should contribute greatly to a realization of the Committee's objectives.

The Committee on Labor Market Research completed its "survey of patterns and factors in labor mobility" in six cities, a project jointly conducted by research centers at the Universities of Chicago, California at Berkeley, California at Los Angeles, Minnesota, Pennsylvania, Yale, and M.I.T. and involving an analysis of data on work histories collected, coded, and tabulated by the Bureau of the Census. The survey yielded twenty-two mimeographed reports made to the Air Force and to the Bureau of the Census, which together financed it. The Committee plans a summary volume of findings available to interested scholars. The Committee conducted a conference on research design and methodology in studies of labor mobility at the University of Minnesota, May 22-25, at which it endeavored to synthesize the implications of its six-city survey and other recent studies and to consider future research on labor mobility including problems of methodology. At its November, 1951, meeting the Committee had reviewed the status of research in various segments of the labor field and sponsored an appraisal and evaluation of research during the past fifteen years on labor mobility, a draft of which was completed and submitted to the Committee in the fall of 1952. The Committee is considering a similar appraisal of research on the resistance of workers to technological innovation.

The Committee on Census Monographs reported that it had completed arrangements for the preparation of thirteen census monographs and that it had made considerable progress in arranging for the preparation of nine others. These will present and analyze census data on various aspects of the population of the United States, the labor force and its occupational and industrial distribution, income distribution, housing in the United States, geographical

location of economic activity, the structure of metropolitan areas, the structure of American agriculture, and trends in manufacturing. While the Committee has not yet arranged for publication of the monographs, when they are completed it contemplates doing so.

Council fellowships or research grants awarded to economists during the past year included three faculty research fellowships (out of five made to social scientists generally); three faculty research grants providing for leaves of absence (out of fifteen made to all social scientists); and four grants-in-aid (out of thirty-one made to social scientists generally).

In 1947, at the request of the American Economic Association, the Council provided funds for translating August Lösch's *Die räumliche Ordnung der Wirtschaft* and translation was completed shortly thereafter. Problems raised by the Alien Property Custodian which delayed publication have now been resolved and the Yale University Press will soon publish the translation.

Respectfully submitted,

GEORGE W. STOCKING

## REPORT OF OUR REPRESENTATIVE TO THE AMERICAN COUNCIL OF LEARNED SOCIETIES

As some readers of these "Proceedings" may not know, the American Council of Learned Societies was organized just after World War I, before the Social Science Research Council was in existence. Its main original purpose was to represent the sector of American scholarly interests not covered by the National Research Council, with its chiefly natural science membership, in relations with the scholars of other countries—especially to give the United States representation in the newly formed International Union of Academies (Union Académique Internationale). Its constituent members therefore included, besides our two oldest academies, the main professional associations in the social sciences as well as literary scholarship. When the S.S.R.C. was formed, it soon closed its membership at seven fields, leaving a number of social sciences unrepresented. Moreover, it was felt that the social disciplines have a humanistic side as well as one more strictly scientific and that their continued participation in a Council now concerned primarily with the humanities would be of advantage on both sides. Thus the A.E.A. is now a member of two Councils—as are the professional associations in four other fields: anthropology, history, political science, and sociology.

Some five years ago, when the first Director of the A.C.L.S., Dr. Waldo G. Leland, reached retiring age, the Council underwent a considerable reorganization. Delegate representation of the constituent societies, which had been two for each, was reduced to one, and a Board of Directors (eight members) established, with substantial reduction of the functions of the delegates and the annual meeting. The secretary of a society may also be its delegate, but this is not the usual arrangement. A distinctive feature of the Council—an annual Conference of Secretaries of Constituent Societies—was continued and has been developed; it is now perhaps the most important service to the social science members. However, delegates receive full minutes of meetings of the Board and information of actions by committees and by the executive and still decide some issues—in the annual meeting or by mail vote. And they elect both the Board and the general officers of the Council.

Although primarily a council for the humanities, the body carries on activities of interest for all fields of scholarship. Notable in the past couple of years has been an intensive exploration of the problem of scholarly publication and distribution where the clientele is too small for regular commercial printing and handling. The Council works in many connections with governmental agencies and the major foundations. It participates, with the S.S.R.C., the N.R.C., and the N.C.E. (National Council for Education), in the Conference Board of Research Councils which handles such activities as the National Scientific Register and the screening and recommendation of candidates for Fulbright awards. The more regular activities of the Council itself are similar to those of the S.S.R.C.: exploring fields of research, selecting and working up projects, and sponsoring applications for funds or ad-



ministering limited funds of its own (chiefly grants from foundations) in support of research or publication.

The Council is now in an "interregnum" as to the directorship. The former incumbent, Dr. Charles E. Odegaard, resigned not long after the annual meeting of January, 1952, and until a successor is chosen, the Assistant Director, Dr. Mortimer Graves, is Acting Director. Your delegate attended the meeting of 1952, which was taken up with general discussion of the situation and problems of scholarship in this country and in the world. The meeting ratified acts of the executive officers and gave authorizations or directives in some matters, but I noted nothing of outstanding interest to report. This may be supplemented by comment from our Secretary, Professor James W. Bell, with respect to the meeting and activities of the Conference of Secretaries. Full reports of the activities of the Council for each year are published in the Proceedings Issue of its *Bulletin*, and the executive offices in Washington, D.C., also issue a quarterly *News Letter* for more frequent communications and announcements, which is sent rather widely to persons connected with the Council or expected to be interested in its work.

Respectfully submitted,

FRANK H. KNIGHT

#### NOTE ON THE CONFERENCE OF SECRETARIES

Three sessions were held of the Conference of Secretaries of the Constituent Societies and one joint session with the Board of Directors of the Council. Topics discussed at the Secretaries Conference were: the role of the Constituent Societies in A.C.L.S. activities, the national registration of specialists in the humanities and social sciences, and the impact of defense mobilization on the societies. Other subjects discussed included: libraries as subscribers for learned journals, use of the societies' mailing lists by others, problems of publishing books and periodicals, increases in dues payments, paid secretariats, and accounting practices in use by the societies.

At the joint session, Messrs. Krusé, Odegaard, and Bell, among others, emphasized the mutual dependence of the Council and the societies, and the importance of planning the activities of each society with reference to their relation to the whole field of the humanities rather than to their own particular field alone.

A nine-point program was adopted on the role of the Constituent Societies of the A.C.L.S. J. W. Bell, of Northwestern University, and Ferris J. Stephens, of Yale University, were re-elected as Chairman and Secretary, respectively, for another term.

Respectfully submitted,

JAMES WASHINGTON BELL

REPORT OF OUR REPRESENTATIVE ON THE BOARD OF  
DIRECTORS OF THE NATIONAL BUREAU  
OF ECONOMIC RESEARCH

In 1952 eleven reports were published by the National Bureau. Five more went to press and several others reached an advanced stage. Five new studies were begun during the year.

The reports published during the year were:

Carl F. Behrens, *Commercial Bank Activities in Urban Mortgage Financing*.  
Arthur F. Burns, Editor, *Wesley Clair Mitchell: The Economic Scientist*.  
Morris A. Copeland, *A Study of Moneyflows in the United States*.

Solomon Fabricant, *The Trend of Government Activity in the United States since 1900*.

W. Braddock Hickman, "Trends and Cycles in Corporate Bond Financing," *Occasional Paper 37*.

Avram Kisselgoff, "Factors Affecting the Demand for Consumer Instalment Sales Credit," *Technical Paper 7*.

Clarence D. Long, "The Labor Force in War and Transition: Four Countries," *Occasional Paper 36*.

James A. Maxwell, *Federal Grants and the Business Cycle*.

Frederick C. Mills, "Productivity and Economic Progress," *Occasional Paper 38*.

*Conference on Research in Business Finance*.

Conference on Research in Income and Wealth, *Studies in Income and Wealth*, Volume Fifteen.

The reports in press at the end of the year were:

W. Braddock Hickman, *The Volume of Corporate Bond Financing since 1900*. This is the first of several volumes coming out of the corporate bond projects. It contains basic data on investment experience with domestic corporate bonds since 1900 and throws new light on the economics of corporate bond financing. The principal findings of this book were summarized in the author's, "Trends and Cycles in Corporate Bond Financing," *Occasional Paper 37*, published in 1951.

Lawrence A. Jones and David Durand, *Mortgage Lending Experience in Agriculture*. This study of farm mortgage distress in the United States is the third volume under the Agricultural Finance Project of the National Bureau.

Simon Kuznets, *Shares of Upper Income Groups in Income and Savings*. This is a study of trends and fluctuations in the distribution of income by size, 1919-48, and their probable impacts on the volume and source of savings. Some of the results of this study were summarized in *Occasional Paper 35* issued in 1950.

*Conference on Regularization of Business Investment.* This volume contains fourteen papers in the Universities-National Bureau Conference on Regularization of Business Investment. It will be the third volume to be published in the "Special Conference Series."

Robert Ferber, "A Study of Aggregate Consumption Functions," *Technical Paper 8*. This paper presents a critical appraisal of a number of methods and results in estimating aggregate consumption functions.

During the year studies were brought to an advanced stage in the fields of wages, employment and productivity; business cycles; capital requirements; agricultural finance, real estate finance, and public finance.

A brief description of the five new studies begun during the year follows:

Herbert Woolley was appointed to the Research Staff to organize a research project on world interarea flows of goods, services, claims, and money.

Robert Lipsey began the compilation of index numbers of prices and quantities of exports and imports of the United States by commodity groups. The purpose is to provide basic series, on a quarterly basis if possible, needed in studies of foreign trade cycles and trends. It is hoped that the series can be extended back to 1869.

A study of bank capital problems was launched under a grant from the Association of Reserve City Bankers. This study, directed by David Durand, is part of the Financial Research Program. Initial attention is given to the declining ratio of capital to total assets of commercial banks and its causes and implications.

A series of studies of the economics of unincorporated business enterprise was initiated in co-operation with the Survey Research Center of the University of Michigan. At the Survey Research Center, Lawrence R. Klein is exploring the general economic characteristics of unincorporated business. At the National Bureau, Daniel B. Suits, a Research Associate for 1952-53, is treating financial aspects of unincorporated businesses with special attention to their growth and decline.

Earl Rolph, a Research Associate for 1952-53, is making a comparative study of national debt and fiscal operations in the United States, Canada, France, and the United Kingdom for the period beginning with 1920.

The Conference on Research in Income and Wealth held a conference in New York in October, 1952, on input-output analysis. It is planned to print the papers dealing with general concepts as Part I in a volume in the series of *Studies in Income and Wealth* and to mimeograph or multilith the more technical papers as Part II to be made available to research workers in the field. Raymond W. Goldsmith is editor of Part I and Philip M. Ritz is editor of Part II.

In October, 1953, the Conference on Research in Income and Wealth will hold a meeting on the subject of capital formation. It is planned to treat three general topics: (1) estimates of capital formation, concepts and measurement, and financial aspects, (2) conceptual and statistical problems in the measurement of capital coefficients and productive capacity, and (3) behavior studies of private capital formation. Tentative plans have been made for a meeting in 1954 on the subject of comparability of national accounts data.

The Universities-National Bureau Committee held a conference on Business Concentration and Price Policy at Princeton, June 17-20, 1952. The papers and discussion presented at this conference will be published in the "Special Conference Series."

The next conference will be on international differences in capital formation and economic growth. It is scheduled for New York in the fall of 1953. A conference on measurement and behavior of unemployment is planned for 1954.

After several years' service, Simon Kuznets and Leo Sharfman retired as Chairman and Vice-chairman of the Universities-National Bureau Committee. George Stigler was chosen as Chairman and G. Heberton Evans, Jr., was elected Vice-chairman.

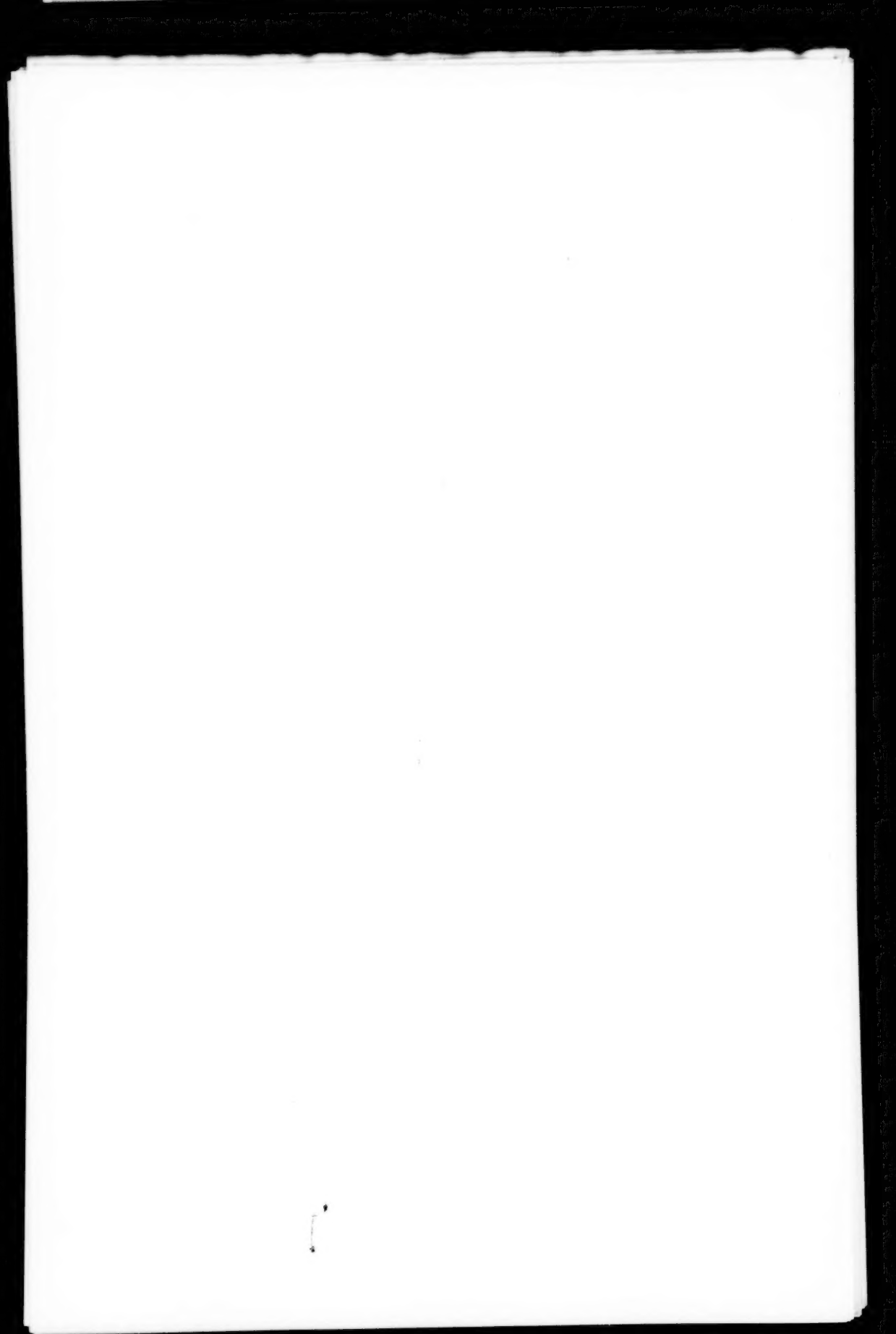
For many years the National Bureau has published and distributed its books. In 1952 an agreement was made between the National Bureau and the Princeton University Press whereby the Press would take over the publication and distribution of National Bureau books on April 1, 1953. Henceforth the Princeton University Press will also handle the distribution of books previously published by the National Bureau as well as the distribution of new books. After April 1, 1953, orders for National Bureau books, new and old, should be addressed to Princeton University Press, Princeton, New Jersey. Orders for *Occasional Papers* and *Technical Papers* should be addressed to the National Bureau which will continue to publish and distribute these.

In 1952, Princeton University was added to the list of universities represented on the Board of Directors and Jacob Viner was elected Director by Appointment of Princeton University. Harold F. Williamson was elected Director by Appointment of the Economic History Association. Solomon Fabricant was appointed Deputy Director of Research. Daniel M. Holland and Herbert B. Woolley were appointed members of the Research Staff.

Members of the Association may make suggestions relative to the work of the National Bureau either directly or through the undersigned who is a member of the Board of the Bureau by appointment of the Association.

Respectfully submitted,

DONALD H. WALLACE





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1953

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